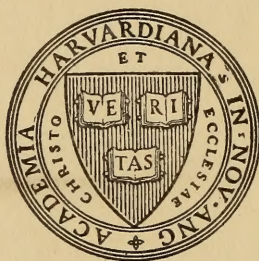


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CASES
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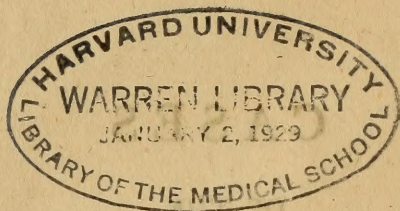
WITH
THE RESULTS
OF THE
TRIALS OF CERTAIN ACIDS,
AND OTHER SUBSTANCES,
IN THE
CURE OF THE LUES VENEREA.

BY
JOHN ROLLO, M.D.
SURGEON-GENERAL, ROYAL ARTILLERY.

SECOND EDITION,
WITH LARGE ADDITIONS.

—•••—
LONDON:
PRINTED BY T. GILLET,
FOR C. DILLY, IN THE POULTRY.

MDCCXCVIII.



DIABETES MELLITUS

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CURE OF THE LIVER AFFECTION

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FOR C. DIX, IN THE ROYAL

MARSHALL

06-14

AS A TESTIMONY
OF THE
SINCERE ESTEEM AND GRATITUDE OF
THE AUTHOR,
THIS WORK IS RESPECTFULLY DEDICATED
TO
THE GENTLEMEN
WHO HAVE SO LIBERALLY CONTRIBUTED TO
ITS UTILITY,
BY
THEIR VALUABLE AND INTERESTING
COMMUNICATIONS.

AS A TESTIMONY

PREFACE

SINCERE RESPECT AND GRATITUDE OF

THE PUBLISHER, former editor of this Work having excited more opportunities of interesting the public and the general community, we are happy in being enabled to the one now offered to the Public, to convey further elucidations on the different subjects.

Several communications have induced us to compile the present edition into one volume; the principal of which was, that the knowledge of the new method of treating the Diabetes Mellitus, and the Lues Venerea, might be more universally diffused. For as

PREFACE.

THE publication of the former edition of this Work having excited considerable attention, and produced more opportunities of ascertaining the facts and opinions which it contained, we are happy in being enabled, in the one now offered to the Public, to convey further elucidations on the different subjects.

Several considerations have induced us to compress the present edition into one volume; the principal of which was, that the knowledge of the new method of treating the Diabetes Mellitus, and the Lues Venerea, might be more universally diffused. For al-

though the Journals, both of this country and the continent, have given a very full account of the first publication, yet as the one now given will contain many interesting additions, it has been thought adviseable, to reduce the price as low as possible, in order to place it within the reach of a greater number of readers.

With the same view, and on account of the many recent communications respecting the Diabetes, and the additional trials of the new remedies in the Lues, we have confined ourselves to these subjects entirely. The observations which were introduced on several diseases apparently arising from stomach affection, and including the application of the new doctrines of chemistry, as well as the description of a morbid poison formed on sores, have been in the present Work purposely omitted.

omitted. They are still, however, to be considered as equally interesting, and will continue to be prosecuted.

Since the publication of the first edition, the history of the Diabetes Mellitus has been rendered more complete by the several communications we have received; and the nature of the disease, as not depending on a primary affection of the kidneys, has been confirmed by dissection. The experiments of MR. CRUICKSHANK on the difference between the *sugar of milk* and that of *diabetic urine*, with those recited among the considerations of some of the objections urged against our doctrine, have also greatly contributed to support our opinions. The experiments of the same GENTLEMAN on *urine and sugar*, while they in some measure unfold the peculiar nature of each, will also assist in the general explanation of Diabetes, as

well as what relates to the urine of patients labouring under other diseases.

The continuation of the results of the trials with the new remedies, in the Lues Venerea will, we trust, be found satisfactory; as it completely establishes their efficacy in the secondary, as well as in the primary states of the disease. In following our practice, so as to obtain the same success, we must recommend it to be conducted, as nearly as possible, in the same manner; and this we do the more earnestly, as we have observed, with regret, in the alledged failures of others, that our management has not been strictly pursued. We are desirous, however, to avoid any particular remarks on the evidence of others, in this part of our subject, as we wish rather to rest on our own personal testimony. But the disinterested and liberal observer will, we trust, avail himself of our labours, so far as they

go,

go, in his more extensive inquiry into the merits of the general question, with respect to the comparative safety and efficacy of *mercury* and the *oxygenated remedies*. In this place we would observe, that DOCTOR WITTMAN has great merit, for the attention he bestowed on the patients whose cases he has described; and it may be proper to remark, that in conjunction with him, MR. CRUICKSHANK, and OURSELVES, watched the progress and termination of the cures.

MR. CRUICKSHANK having been appointed *Apothecary* as well as *Chemist to the Ordnance*, did not perform the duties of *Surgeon*; of course, any further detail of cases, since the first edition of our Work, was the business of another, which DOCTOR WITTMAN has very diligently and faithfully fulfilled.

DOCTORS

DOCTORS CHISHOLM and DAVIDSON, in the West-Indies, have tried the *nitrous acid*, and the *oxygenated muriate of potash*, in *hepatic affections*, *remittent*, and *yellow fever*. The following are extracts of letters from DOCTOR CHISHOLM on the subject.

“ *Martinique, 6th May, 1798.*

“ The diseases in which we have made trials of these medicines, have been hitherto hepatic affections and remittent fevers. No case of yellow fever has occurred since they have been in my possession. The nitrous acid, diluted in the proportion of a drachm, or a drachm and a half, to a quart of water, has been used with complete success, in all the cases of hepatic affections which have been admitted into the Ordnance Hospital, at Fort Royal, during the latter part of
March

March and all the month of April. The number of these has been nine. The oxygenated muriate of potash has been equally successful in one case of hepatic affection, attended with dropsy, and in three cases of remittent fever; the character of which was such, as would have demanded the exhibition of calomel, had not the muriate been in our hands. These cases have been under the charge of DOCTOR DAVIDSON, the acting Ordnance Surgeon on this station, whose zeal for the improvement of his profession, induced him to try the oxygenated remedies, so warmly recommended by respectable authorities. As his report to me will give you much pleasure and satisfaction, I shall subjoin it."

" We have had a large proportion of hepatic affections with swellings of the spleen, &c. I have tried, agreeably to
your

your directions, the nitrous acid. Several have been discharged, cured; and all of them have been relieved. There was one singular case of enlarged spleen, with dropfical swelling of the abdomen and hydrocele. The nitrous acid, in any state of dilution, would not fit upon the stomach. The oxygenated muriate of potash in four grain doses, was ordered every four hours; which, on the third day, produced such a remarkable whiteness of the tongue, as to excite the astonishment of the orderly man, JACKSON, who noticed it to me. The quantity of urine was considerably increased, and the swelling of the abdomen entirely disappeared within a week. I have discharged him well. I intended to have tried the injection of port wine for the cure of the hydrocele, but the effects of the oxygenated muriate have disappointed me. From
the

the trials made with the nitrous acid, in hepatic affections, and in a case of Lues under cure, I think we have added to our stock an invaluable remedy. The oxygenated muriate of potash also promises to be of great utility. I have made a few trials with it in dyspepsia, and other cases of debility, as well as in hepatic affections, with great advantage. I propose giving it in small doses frequently repeated."

Martinique, 9th June, 1798.

"The nitrous acid is a most safe and efficacious medicine, in hepatic complaints of old standing, in all venereal obstructions, and diseases depending upon them. The oxygenated muriate of potash has cured in every instance of the common bilious remittent fever, with ease and safety. But neither of these remedies, from the trials we have
made,

made, can be in the smallest degree relied upon, in the endemic yellow fever, or the typhus icterodes of the country; on the contrary, they do harm. There has been no opportunity of trying them in contagious fever."

The exhibition of these remedies in this Country, on the Continent, and in the West-Indies, in Lues, hepatic affections and fever, with the new treatment in the Diabetes Mellitus, and the general disposition of applying the doctrines of chemistry to medicine, renders it extremely probable, that the nature and cure of other diseases will become more successfully illustrated.

*Woolwich,
Royal Artillery Hospital,
4th November, 1798.*

CONTENTS.

	PAGE
<i>Preface to the First Vol. of the First Edition</i>	1
<i>Second ditto of ditto.</i>	9

PART I.

Cases of the Diabetes Mellitus; with a general view of the nature of the disease, and its appropriate treatment: including, a concise account of what has been written on the subject; an answer to some objections urged against the doctrine we have delivered; and chemical experiments on urine and sugar.

CHAP. I.—*An account of Two Cases of the Diabetes Mellitus; with remarks as they arose during the progress of the cure: to which are subjoined, an abstract of the most remarkable circumstances and changes in the disease during the progress of the treatment; and general and comparative inferences resulting from both Cases.*

<i>Case I.—Of Captain Meredith.</i>	17
<i>Present state of his disease.</i>	ib.
<i>Retrospect of its origin and progress</i>	21
<i>Nature, progress, and treatment..</i>	23
<i>Hepatised ammonia, preparation and dose.</i>	52

Case

	PAGE
<i>Case II.—Of a General Officer.....</i>	63
<i>The regimen.....</i>	70
<i>From Doctor Trotter, Physician to his Majesty's Fleet, in continuation of the Case.....</i>	122
<i>Termination of the Case.....</i>	127
<i>An abstract of the most remarkable circumstances and changes in the disease, during the pro- gress of the cure in both Cases.</i>	
<i>Of Case I.....</i>	128
<i>Of Case II.....</i>	132
<i>General and comparative inferences resulting from both Cases.....</i>	138
CHAP. II.—Of what has been communicated to us on the Diabetes Mellitus.	
SECT. I.—Cases and Communications since the dispersion of our notes of Captain Meredith's Case, and previous to the first Edition of the Work.....	142
<i>From Doctor Duncan, of Edinburgh.....</i>	143
<i>Falconer, of Bath.....</i>	ib.
<i>Baillie, of London.....</i>	144
<i>Mr. Abernethy, of ditto.....</i>	145
<i>Doctor Beddoes, of Bristol.....</i>	146
<i>Currie, of Liverpool.....</i>	147
<i>Mr. Marcet, of Edinburgh.....</i>	150
<i>Abstract of James Walker's case.....</i>	152
<i>Doctor Cleghorn, of Glasgow.</i>	
<i>Case I.—Of John Maclean.....</i>	158
<i>Case</i>	

	PAGE
<i>Case II.—Of John Roger.</i>	168
<i>From ———, ———, through Mr. Astley</i>	
<i>Cooper, of London.</i>	179
<i>Doctor Gerard, Liverpool.</i>	183
<i>Case of John Clarke.</i>	184
<i>Hepatised ammonia.</i>	230
<i>Some remarks on these communications.</i>	231
<i>Hepatised ammonia.</i>	235
<i>Nitrous Acid.</i>	236
SECT. II.—Cases and communications since the <i>first Edition of the Work.</i>	
<i>From Doctor Marcet, of London.</i>	
<i>Continuation of the case of Walker, page</i> <i>152, by Doctor de la Rive.</i>	237
<i>Doctor Gerard, Liverpool.</i>	240
<i>Case I.—Of Mary Jackson.</i>	<i>ib.</i>
<i>II.—Of Elizabeth Francis.</i>	242
<i>Doctor Cleghorn, of Glasgow.</i>	
<i>Case I.—Of a Weaver.</i>	244
<i>II.—Of a married woman.</i>	246
<i>III.—Of a widow.</i>	<i>ib.</i>
<i>IV.—Of an unmarried girl.</i>	247
<i>Continuation of Roger's case, page 168</i>	<i>ib.</i>
<i>of Maclean's, ditto 158.</i>	<i>ib.</i>
<i>Of a disease of horses.</i>	249
<i>Continuation of the married woman's</i> <i>case, page 246.</i>	250
<i>Doctor Storer, of Nottingham.</i>	
<i>Continuation of Doctor Aldrich's case,</i> <i>page 179.</i>	253

<i>An account of seven acute cases of the</i>	
<i>disease.....</i>	257
<i>Of a mild degree of the disease.....</i>	259
<i>From Doctor Jameson, of the Royal Artillery.</i>	
<i>Case of Nixon.....</i>	262
<i>Mr. Shirreff, of Deptford.</i>	
<i>Case of a young lady.....</i>	271
<i>Mr. Houston, of London.</i>	
<i>Case of a lady.....</i>	282
<i>Continuation of the case by the Author.</i>	288
<i>Doctor Pearson, of London.</i>	
<i>Case I.—Of H. Laurie, Cabinet-maker.</i>	297
<i>II.—Of N. Crisp, Shoemaker....</i>	304
<i>Doctor Huck Saunders's</i>	
<i>account of it.....</i>	306
<i>III.—Of a Gentleman.....</i>	308
<i>Remarks.....</i>	314
<i>Doctor Marshal, of London.</i>	
<i>Case of Hinton Liddel, a Carpenter,</i>	
<i>with dissection.....</i>	324
<i>Doctor Willan, of London.</i>	
<i>Case of a Gentleman.....</i>	330
<i>Experiments on his urine....</i>	334
<i>Mr. Thomas, London.</i>	
<i>Case of a Watchmaker.....</i>	335
<i>Its history.....</i>	<i>ib.</i>
<i>Treatment.....</i>	338
<i>Dissection.....</i>	342
<i>Some remarks on these communications.....</i>	346

CHAP. III.—*A concise narrative of what has been written, or advanced, respecting the Diabetes Mellitus.*

<i>Doctor Willis</i>	356
<i>Mead</i>	357
<i>Metz</i>	<i>ib.</i>
<i>Dobson</i>	<i>ib.</i>
<i>Cullen</i>	359
<i>Home</i>	361
<i>Darwin</i>	366
<i>Richter</i>	369
<i>Cawley</i>	371
<i>M'Cormick</i>	374
<i>Mr. Warner</i>	<i>ib.</i>
<i>Doctor Shee</i>	375
<i>M. Jacquin</i>	<i>ib.</i>
<i>Doctor Ferriar</i>	377
<i>Mr. Scott</i>	<i>ib.</i>
<i>Sum of the whole</i>	378

CHAP. IV.—*A general view of the history, nature, and appropriate treatment of the Diabetes Mellitus.*

SECT. I.— <i>Of the history of the Diabetes Mellitus</i>	381
II.— <i>Of the causes and nature of do.</i> ...	386
III.— <i>Of the appropriate treatment of do.</i>	400

CHAP. V.—*Objections to our doctrine of the Diabetes Mellitus considered, with a concise recapitulation*

recapitulation of the principal arguments in its support.

First objection: that saccharine matter has not been detected in the blood, or in the stomach. 406

Experiments 409

Inferences 416

Second objection: that the disease often shews symptoms of dyspepsy, or weakness of digestion 419

Third objection: that the stomach affection may be sympathetic of diseased kidney, from the intimate consent subsisting between both. 423

Case of George Higson, or of a Diabetes depending on an affection of the kidneys. 424

James Crush, ditto. 425

Fourth objection: that the kidneys are capable of forming or secreting saccharine matter under a peculiar action: the breasts of women form this matter copiously. 427

Experiments by Mr. Cruickshank with the view of ascertaining the resemblance between the saccharine matter of milk and diabetic urine. *ib.*

Case of a soldier of the West Kent Militia, with dissection. 432

Case of a child, with dissection. 434

Recapitulation of the principal arguments supporting the doctrine of Diabetes. . . . 436

CHAP. VI.—*Experiments on urine and sugar, by
Mr. Cruickshank.*

SECT. I.—*Experiments on urine.....* 438

Manner of distinguishing several diseases by the urine. . . 447

II.—*Experiments and observations
on the nature of sugar, &c.* 451

An experiment ascertaining more completely the difference between common sugar, and the saccharine matter secreted by the breasts of animals, see page 427..... 467

A table shewing, at one view, the products resulting from the destructive distillation of sugar, honey, sugar of milk, gum arabic, and tragacanth. 470

Experiments shewing that neither vegetable nor animal mucilages, when pure, are susceptible of the vinous fermentation..... 474

Conclusions drawn from the whole, shewing the component parts of sugar, sugar of milk, gum, &c. *ib.*

PART. II.—*The results of the trials of various acids, and some other substances, in the treatment*

ment of the Lues Venerea, by Mr. Cruickshank, and other Surgeons of the Artillery.

CHAP. I.—*The results of the trials of various acids, and some other substances, in the treatment of the Lues Venerea, as described in the first edition of the work.*

SECT. I.—*Trials by Mr. Cruickshank.* 481

Cases in which the nitrous acid was employed. 484

Cases in which the oxygenated muriatic acid was employed. 490

Cases treated by lemon juice, or citric acid. 498

Cases treated by the oxygenated muriate of potash. 504

Observations on the foregoing cases. 514

SECT. II.—*Trials by Doctors Irwin, Jameson and Wittman.* 525

By Doctor Irwin. *ib.*

Jameson 526

Wittman 531

CHAP. II.—*The results of the trials of the nitrous acid, and some other substances, in the treatment of the Lues Venerea, since the first edition of the work.*

SECT. I.—*Trials by Doctor Wittman.* 539

Cases treated by the nitrous acid. *ib.*

Cases

<i>Cases treated by the oxygenated muriate of man- ganese.....</i>	559
<i>by the oxygenated muriate of potash</i>	563
<i>by the nitrous acid and oxygenated muriate of potash</i>	585
<i>by the new reme- dies and mercury</i>	595
<i>Remarks</i>	604
SECT. II. — <i>A Table containing a list of the patients, with the venereal disease, who have been treated in the Royal Artillery Hospital at Woolwich by the new re- medies</i>	609
<i>General abstract of the patients as enumerated in the table..</i>	618
SECT. III. — <i>Some additional remarks on the effects of the nitrous acid, the oxygenated muri- ate of potash, &c. in the Lues Venerea, by Mr. Cruikshank</i>	619

APPENDIX.

ERRATA.

- Page 26, lines 3 and 4, *for* appears to be, *read*, should be.
60, line 9, *for* it shews, *read*, they shew.
131, line 22, *for* from, *read*, to.
317, line 22, *for* insufficient, *read* sufficient.
348, line 12, *for* more than, *read* more or less than:
520, line 4, *for* proved, *read* improved.
536, dele Case XXXII. as it forms Case I. of page 539.

PREFACE,
TO THE FIRST VOLUME,
OF THE
FIRST EDITION.

IN the year 1777, about the month of May or June, so far as can be recollected, I saw a case of the Diabetes Mellitus in a weaver at Edinburgh. He had been at least four months in the Royal Infirmary without having derived any advantage, and was chiefly under the care of the late Dr. Hope, Professor of Botany. When the patient was discharged, a Mr. Johnstone, then a Student of Physic, and myself, detained him a few days, and paid his expences, in order to bleed him, and obtain some of his urine, so as to ascertain the appearances and spontaneous changes. I well remember that the blood and urine exhibited the appearances described by Dr. Dobson; but the papers, and a portion of the saccharine

B

extract

extract, which I carried with me abroad, were lost in the hurricane at Barbadoes in 1780.

From that period I had not met with a case of Diabetes, although I had observed an extensive range of disease in America, the West Indies, and in England, until the year 1796.

Captain Meredith, of the Royal Artillery, being an acquaintance, I had, from my situation, seen him very frequently, previous to his going on camp duty in 1794, but then he had no disease; however, he always had impressed me, from his being a large corpulent person, with the idea that he was not unlikely to fall into disease.

On the 12th of June, 1796, he visited me, and though I was at once struck with the diminution of his size, yet, at the same time, the colour of his face being ruddy, I received no impression, otherwise than of his being in health: a moment's conversation, however, convinced me of the contrary. He assured me he was very ill, that he had been advised to a change of situation, and had come to consult me, to arrange his affairs, and then to return

turn to his family at Yarmouth, where he expected to remain for some time on duty.

He complained of great thirst and a keenness of appetite; his skin was hot, dry and parched; and his pulse small and quick. He told me his complaints had been attributed to an old disease, and a liver affection. The thirst, dry skin, and quick pulse, marking a febrile state, depending probably on some local circumstance, and connecting these with the keenness of appetite, Diabetes immediately suggested itself to me. I enquired into the state of his urine, which I found in quantity and colour to be characteristic of the disease; and was at the same time much surprised, that for the two or three months he had been under the care of a Physician and Surgeon, the circumstance of increased urine had not been known to them. The patient told me, as he drank so much, the quantity of urine had appeared to him a necessary consequence; and of course never having been asked about it, he had given no information. I directed him to keep the urine he next passed, and, on examination, it was found to be sweet; in con-

sequence of which the disease became sufficiently ascertained.

I dissuaded him from renting his house and selling his furniture; and in the most guarded, though effectual manner, told him, that his disease would prove a tedious one; and as its nature was not well understood, he might be inclined to obtain other opinions. As Woolwich was so near London, the seat of the first medical intelligence, he might prefer returning should the disease not be removed; and I promised to assist him in every satisfaction he could desire with regard to further advice.

I wrote, by him, to his Physician; and we from time to time corresponded; in the course of which I told him I had formed a peculiar opinion of the disease; but previous to my communicating it, I requested him to take some blood from our patient, in order to ascertain its sensible properties and observe its spontaneous changes. I did this with a view of determining a material point towards explaining the nature of the disease. For the case I had seen at Edinburgh, and Dobson's
account,

account, with Dr. Cullen's opinion, had prepossessioned me with the idea of the disease being a primary and peculiar affection of the stomach. In a medical party in London, I mentioned this case and my views of it so far; when a very ingenious anatomist and physiologist declared he had seen some cases of the disease in a public hospital in town: in one of them the blood was not found to have saccharine properties, and on the whole he was of opinion the disease was a primary affection of the kidneys.

Our patient was not bled. As he was getting worse about the end of November, an application was made for his return; and he arrived at Woolwich, as the Case states, on the 16th of October.

I now refer to the Case, printed notes of which were dispersed in January last, to every person in England or Scotland, who I thought were likely to meet with the disease; and I solicited a trial of the mode of cure, with an account of the results. These notes comprehended the first Case so far as it then had proceeded. For the results of the trials of others I should have waited, had I not so immedi-

ately met with another case of the disease, which proved conclusive, though not so entirely satisfactory as it might have turned out, had our patient been possessed of more steadiness. The importance of the subject, however, has urged me to publish it without further delay, and at the same time to extend the account of the former case to the present period. But we shall not be precluded from repeating the publication, with any additional cases of our own, or those of others with which we may be favoured.

To the account of these Cases, we intend to subjoin a general view of the nature and treatment of the Diabetes Mellitus, including some observations on other diseases connected with stomach affection; a brief narrative of what has been hitherto advanced on the subject; and a detail of any communications transmitted to us since the dispersion of our notes; with a relation of some experiments on the nature of sugar, by Mr. Cruickshank. The whole forming a tolerable description of the new and old doctrines respecting the disease.

I have much satisfaction in acknowledging here the obligations I am under to my friend

Mr.

MR. CRUICKSHANK, (*Chemist to the Ordnance, and a Surgeon of Artillery*) who readily entered into my views of the nature and treatment of the disease, and has greatly assisted me in the prosecution of the subject by his medical opinion, exclusive of the important advantages it has derived from his valuable and accurate experimental investigations.

ROYAL ARTILLERY HOSPITAL,
Woolwich, March 25, 1797.



PREFACE,
TO THE SECOND VOLUME,
OF THE
FIRST EDITION.

THE number and importance of the communications on the Diabetes Mellitus, since the dispersion of the notes on Captain Meredith's case; and the success of the first trials of the Nitrous Acid, and other substances, in the cure of the Lues Venerea, having induced us to a repetition of them; this work has been extended beyond its original design.

However, it is expected that the value of the communications on the Diabetes, and the detail of the effects of the various new remedies so happily employed in the Lues Venerea, will prove a proper apology for any additions on which the Public may be solicited to bestow their attention.

In

In this Hospital, where there have been annually admitted, for these three years past, upwards of 300 patients with the venereal disease, the effects of the most guarded mercurial treatment have been observed, in many cases, to be so detrimental, as not only to excite consumption, but other affections of a scrophulous nature, producing death, or an incapacity for service, that any remedy proposed for the removal of the disease, destitute of these injurious effects, was likely to command proper attention, especially if this remedy was likely to turn out more effectual than mercury. How very frequently has the venereal disease returned, or rather its secondary state occurred, after having been apparently cured, and that even by the best masters of the Healing Art!

The Chemical Lectures given by Mr. Cruickshank to the Royal Military Academy, in which he adopts the new system generally, having been attended by myself and the Surgeons of Artillery, our reflections have been directed to the new doctrines, and their application to medicine and surgery.

The success of the treatment in Captain Meredith's Case, which the chemical doctrines
were

were employed to illustrate; and the annunciation of Mr. Scott's paper on the efficacy of the Nitrous Acid in the Lues Venerea, naturally corroborated our hopes of further improvement. After which Dr. Currie's testimony, and that of others, in favour of the Nitrous Acid, as an efficacious and certain remedy for the venereal disease, were communicated.

Under these impressions, I proposed a full and complete trial of it here; and in order that a good acid might be obtained, I applied to the BOARD OF ORDNANCE, who very readily directed their Druggist to supply it.

MARQUIS CORNWALLIS, *the Master General*, and the BOARD, have bestowed very liberal attention to the medical department, in their compliance with every requisition which has been made for the improvement of medicine, as well as for the comfort of the sick.

In this Hospital we form a medical meeting, and we are collecting a library and museum under the patronage of the BOARD.

A Clinical Ward is established, containing six patients, selected from the other cases in the Hospital, who are placed under the care
of

of one of the Surgeons, a charge taken in rotation. This ward is supposed to be visited by all the Surgeons and their Assistants.

At this period Mr. *Cruickshank* took charge of the ward, and it was proposed to admit only primary cases of the Lues Venerea. But on the supposition that if mercury, according to Girtanner, or the nitrous acid, according to Scott, cured the disease by imparting oxygene to the system, it was suggested by Mr. *Cruickshank* to try other substances. He therefore selected the citric acid, the oxygenated muriatic acid, and the oxygenated muriate of potash, as bodies very readily parting with their oxygene. His accounts of these trials I announce to the public with the greatest satisfaction, as an important acquisition to the practice of medicine. I have also added the testimonies of some of the other *Surgeons of the Artillery*, with regard to the efficacy of the nitrous acid; and have subjoined an account of a peculiar sore, as being connected with the other subjects, so far as the application of the new doctrines of Chemistry is concerned.

These different facts are extremely gratifying, as they hold up remedies likely to turn out
more

more generally successful, and less injurious than mercury in the cure of the Lues Venerea; and probably more extensively useful in other diseases, especially those arising from contagion, and morbid animal poisons. *The oxygenated muriate of potash, in particular, merits a trial in Hydrophobia.*

Of these new remedies, the oxygenated muriate of potash will no doubt be preferred. It has been found of superior efficacy in the Lues in its primary, and, from some trials, we have no doubt of its being equally so in its secondary state. We have seen that it not only speedily removes the disease, but that the general health, instead of being impaired by it, seems to be invigorated. The venereal sores have healed, under the action of these remedies on the system, gradually and firmly, the favourable changes being daily conspicuous. This affords a well-founded prospect of a radical cure; and which is more convincing, as no relapse has been yet discovered, though some of the patients have been cured upwards of two, and several upwards of three months. Hence two objections of the most essential

essential nature to which mercury is liable will be removed.

On the whole we trust the work, voluminous as it has turned out, will not be felt irksome, but prove of some benefit to the science, whose improvement we are zealously and disinterestedly engaged to promote, as it leads to the extenuation of human suffering.

ROYAL ARTILLERY HOSPITAL,

Woolwich, July 14, 1797.

PART I.



CASES

OF THE

DIABETES MELLITUS;

WITH

A GENERAL VIEW

OF

THE NATURE OF THE DISEASE,

AND

ITS APPROPRIATE TREATMENT:

INCLUDING,

A CONCISE REVIEW OF WHAT HAS BEEN WRITTEN ON THE SUBJECT; AN ANSWER TO SOME OBJECTIONS URGED AGAINST THE DOCTRINE WE HAVE DELIVERED; AND CHEMICAL EXPERIMENTS ON URINE, AND SUGAR.

DIABETES MELLITUS.



CHAP. I.

An Account of Two Cases of the Diabetes Mellitus ; with Remarks as they arose during the Progress of the Cure: to which are subjoined, an Abstract of the most remarkable Circumstances and Changes in the Disease during the Progress of the Treatment; and general and comparative Inferences resulting from both Cases.

CASE I.

ON the 16th October, 1796, CAPTAIN MEREDITH, of the *Royal Artillery*, was examined, and the following history comprehends the present state of his disease, and a retrospect of its origin and progress.

Present State of the Disease.

HE voids about twelve quarts of urine in twenty-four hours; since last night has preserved seven quart bottles, being the quantity made; it is of a light straw colour, has no smell of urine, but has

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a whey

a whey and violet flavour, and its taste is very sweet.

His thirst is excessive, and he drinks during the day seven or eight quarts, and even upwards; the tongue is whitish and moist; there is a clamminess in the mouth, and he spits a white frothy saliva of a sweetish taste. His appetite for food is variable, sometimes unusually keen, and at odd times, as in the night.

His skin is dry, but not unusually warm; pulse rather weak, and not exceeding 84. His face flushed.

He is frequently sick, and throws up matter of a viscid nature, and of a bitterish, and sweetish taste. After eating he has a pain of his stomach, which continues often half an hour.

He has a constant pain in the region of both kidneys, extending forwards, but more particularly in the right, in which there seems to be a greater fullness and tenderness to the touch; there is likewise a retraction of the testicle, with a weakness, sense of coldness, and at night an œdematous swelling of the leg on the same side; he also complains of a pain and tenderness of the great toe. He feels a singular, painful and fluttering sensation in his belly, extending from the situation of his kidneys.

He is regular in his bowels, though sometimes
inclining

inclining to costiveness; his stools are of a greenish colour, and have no unpleasant smell.

The prepuce of the penis does not retract; it has a whitish appearance, with excoriation and soreness, but is not swelled.

The gums are reddish, and have the appearance as influenced by mercury, the teeth feel loose to him, and as on edge, or like the sensation from sharp acids, and they are peculiarly white; he has lost two of them. There is a fullness about the eyes, with a turbid yellowish cast. He has slight and occasional head-achs.

His diet is animal food and vegetables; he has not been particularly restricted; he drinks from a pint to a bottle of port wine daily—other drink, toast and water. He uses horse and walking exercise, but cannot walk two miles without much fatigue.

Mr. *Cruickshank* took 36 ounces troy weight of urine voided to-day, and it yielded by evaporation three ounces and one drachm of saccharine extract, of the appearance of molasses, but thicker, having nearly the consistence, of wax, and somewhat tenacious. If, therefore, the whole of the day's urine had been evaporated, it would have yielded about 29 ounces troy weight, an astonishing quantity to be formed and separated daily from the system. By standing in the air it became moist, and

of nearly the consistence, smell and appearance of treacle.

Treating some of this extract with the nitrous acid, he procured the saccharine or oxalic acid; and with a smaller proportion of the acid it produced a substance, which in resemblance, and smell, could not be distinguished from honey.

The urine, in appearance, taste, and spontaneous changes, and the result obtained by evaporation, may be considered as similar to what has been observed by Dobson and others, though there was less sugar and more animal mucilage than in the diabetic urine of the former.

Two portions of blood, of about four ounces each, were taken by Dr. *Wittman*, (who, as *Surgeon of the Battalion* the *Officer* belonged to, attended at my request to superintend the execution of the plan of treatment, which he has done with attention) on the 18th of October, from the same vein, and at the same time: on standing in the inside of a window fronting the north, (the thermometer of Fahr. in the air being 55) the appearances resembled exactly those described by Dobson, except that the serum did not impart a sensibly sweet taste; to me it tasted as whey with a greater than necessary proportion of rennet. The crassamentum of the first cup had a slight buff, with rather less serum than natural, and which was opaquely whitish;

whitish; the crassamentum of the second cup had more of the buffy coat; and in both cups this coat was of a bluish colour, similar to what mercury sometimes produces.

On the same day a portion of healthy blood was taken and placed under the same circumstances of temperature, &c. and in the same room, with one of the portions of diabetic blood.

In two days this blood assumed a caseous appearance on the surface, which disappeared with the evaporation of the serum, and the whole mass became dry and resinous in appearance, without having undergone (unless the throwing out a slight animal smell for two or three days, with a mould on the surface of the crassamentum, be supposed marks of it) any apparent putrefactive process; and on the 4th of November, being sixteen days from the operation, it remained in the same state, and continued so, 22d of May, 1798: whereas the healthy blood exhibited evident marks of great putrefaction in four days, and we were obliged to throw it away on the seventh.

Retrospect of the Origin and Progress of the Disease to its present State.

THIS disease has continued seven months and upwards. I saw the patient for a day or two in June, when the disease was detected. Previous to which, he had used nitre and small doses of mer-

cury, but then the disease, as diabetes, had not been ascertained. From June to the date of the present report, he had been living on the kind of diet described, and had taken some remedies under the direction of an eminent Physician at Yarmouth, the principal of which were bark and alum. Occasionally he found himself relieved, having less fever, and the quantity of urine being diminished at one time to two or three quarts a day, but without any change in its sensible qualities. Sugar was also allowed during this treatment, which he took in the form of treacle, and spruce beer in considerable quantity, and the disease seemed to increase during its use.

He has fallen away in fat and flesh considerably, and his muscles are flabby. In October, 1794, when in apparent health, he weighed 16 stone and 8 pounds, and in November, 1796, 11 stone 8 pounds, shewing a loss by the disease of no less than five stone in weight.

For the six months preceding the attack of the disease, he was sick, and vomited at least two or three times a week, and he frequently brought up from the stomach, during these vomitings, different things which he had eaten several days before, unaltered, and the taste was generally sour.

He always eat heartily and drank freely, but not intemperately, and was fond of high seasoned and fat dishes. He had had two regular attacks of
gout,

gout, and had, at other times, two severe fits of cholic. He has been twice married, and has two children. His age is 34. Stature 5 feet 11 inches and $\frac{3}{4}$. Hair light brown. Eyes dark blue. Complexion fair.

On a subsequent enquiry into his mode of life for several years previous to the six months immediately preceding the diabetic attack, he gave me the following account.

That during the three years preceding that time, he had been very actively employed in camp duties; and his appetite was then so good, or he eat so keenly as to be taken notice of by his brother officers; he had no complaint, but on the contrary conceived himself in high health. And that for some years preceding these, he was less actively employed, and though he eat heartily, his appetite and indulgence were not remarkable.

The Nature and Progress of the Disease, with its Treatment from the 16th of October.

As the disease was evidently going on, and of late very rapidly, it was thought proper to adopt steps the reverse of what had been pursued.

Two views of this disease presented themselves; the one as depending primarily on a changed process of digestion, the other on a primary action and condition of the kidneys.

Mr. Cruickshank and Dr. Wittman having seen

the patient on the 17th with me, it was agreed to meet on the evening of the 18th, so as to form our view of the nature of the disease, and a corresponding treatment. To them I submitted the following remarks, which were founded on the history of the case, and on what had passed in previous conversations on the subject.

“ 1. The stomach affection, pointed out by the variation in the degree of appetite, and the sensation after eating; the state of the digestion for six months previous to the actual appearance of the disease; the costive habit and the appearance of the stools; the taste of the salivary discharge; the phenomena of the blood, and the wasting of the body, mark a general disease depending on a changed and peculiar state of the stomach, by which sugar or matter possessing saccharine properties is copiously formed, with a defect of assimilation. The mere defect, however, of which may not account for the quantity of saccharine matter formed, though it certainly constitutes part of the nature of the disease. The existence of such a defect in the assimilating powers we apprehend is manifest from the quantity of animal, exclusive of saccharine, matter voided with the urine, and from the wasting of fat and flesh, he having lost five stone weight by the disease.

2. The serum of the blood apparently containing less saccharine matter than the urine, may depend

pend on the power of the kidneys in separating it in common with the other saline matters of the blood; but proving a new and peculiar stimulus, their action is increased, and the saccharine matter consequently separated speedily and in proportion to its formation in the stomach.

3. The buff on the blood, the white tongue, the thirst and quickened pulse, with the heat and dryness of the skin, and the flushed face, point out an increased action of some kind in the whole system.

4. The painful state of the kidneys, the feelings in the loins and belly, and of the right leg, point out some morbid state of the kidneys, arising from the long continuance of an increased action, and the operation of a peculiar stimulus.

5. The quantity of urine discharged being greater than any quantity of liquids or solids received into the stomach, there may be a greater absorption from the skin and lungs. The increased absorption from the skin no doubt depends upon the great quantity of fluids separated by the kidneys; and this secretion, as has been suggested in the 2d and 4th inferences, upon some peculiar stimulus applied to these organs. The skin absorption may therefore be considered as an effect, and an action of necessity. But exclusive of increased absorption of mere fluid by the skin, it is supposed there may be something peculiar absorbed by the skin and lungs, and
which

which may have a share in maintaining the disease after it has been produced.

6. The objects of treatment therefore appears to be to destroy the saccharine process going on in the stomach, to promote a healthy assimilation, and as auxiliaries, to prevent the supposed increase of absorption from the surface, to diminish the increased action, and to change the imagined derangement of the kidneys."

The particular arrangement of the treatment as resolved upon, was as follows.

1st. The diet to consist of animal food principally, and to be thus regulated :

Breakfast.—One and a half pint of milk and half a pint of lime-water, mixed together ; and bread and butter.

Noon.—Plain blood-puddings, made of blood and suet only.

Dinner.—Game, or old meats, which have been long kept ; and as far as the stomach may bear, fat and rancid old meats, as pork. To eat in moderation.

Supper.—The same as breakfast.

2dly. A drachm of kali sulphuratum to be dissolved in four quarts of water which has been boiled, and to be used for daily drink.

No other article whatever, either eatable or drinkable, to be allowed, than what has been stated.

3dly.

3dly. The skin to be anointed with hog's lard every morning. Flannel to be worn next the skin. The gentlest exercise to be only permitted; but confinement to be preferred.

4thly. A draught at bed-time of twenty drops of tartarised antimonial wine, and twenty-five of tincture of opium; and the quantities to be gradually increased. In reserve, as substances diminishing action, tobacco and foxglove.

5thly. An ulceration, about the size of half a crown, to be produced and maintained externally, and immediately opposite to each kidney. And,

6thly. A pill of equal parts aloes and soap, to keep the bowels regularly open.

On the 19th October (when he was in the same state as on the 16th) the patient had a copy of the plan of treatment, which he commenced the same day, and was desired to journalize as he went on.

So soon as the 21st some changes occurred; he made in the 24 hours only six quarts of urine, and drank only three quarts of the sulphurated alkaline water; the urine was not so pale, had a cloud in it, and was more urinous in smell.

We think it proper here to observe, that the blood-letting seemed to relieve the patient, as he felt on the evening of the same day, according to his own expressions, lighter, cooler, and more cheerful, and had less pain about the kidneys. This

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was on the 18th, the day before the particular treatment was commenced, which circumstance confirms our 3d inference of an increased general action.

November the 1st.

The only alteration in the treatment since the 21st October, was in the occasional use of sulphur in place of the pills, and the kali sulphuratum increased to two drachms daily. This day the quantity of urine did not exceed four quarts, and the urine was of a higher colour and more urinous smell; thirst less; the drink not exceeding two quarts a day; skin moist, and perspires freely in the night; the stomach and belly are much less uneasy, though he complains much of pain from the ulcerated parts in the loins; stools large and very offensive.

Supposing that the quantity of alkaline salt he took daily in the kali sulphuratum, might have some improper effect on the kidneys, it was resolved to try the hepatised ammonia (pure volatile alkali saturated with hepatic gas. See Dr. Crawford's paper on muriated barytes, in the second volume of the Medical Communications) a medicine proposed by Mr. *Cruikshank*, who was of opinion it might prove a more certain and active medicine than the other on the stomach, in diminishing its action, as well as that of the system in general. He was directed to take five drops in
each

each half pint tumblerful of water as drink. He took the first day 35 drops at different times, which in the evening produced sickness and vomiting, with a giddiness and drowsiness. He threw up some apple-pie which he had secretly eaten three days before. The apples and crust had not apparently undergone the slightest alteration. He was directed to leave off the hepatised ammonia for one day, and then to begin with two drops to each tumblerful.

On the 4th he drank only three pints of water, and made only two quarts of urine, which to him and his servants (who had been in the habit of tasting his urine from curiosity) was not sweet, and it deposited a red, sandy, or lateritious sediment.

On the 5th the opiate at bed-time was discontinued, and on the 8th the rubbing with the hog's lard was left off.

The unction with hog's lard being a troublesome and disagreeable part of the treatment, was discontinued as soon as a decided change took place in the urine, with the intention of renewing it again if necessary. It being now determined to simplify the procedure as much as possible, the parts deemed most essential were only to be retained, and these we conceived were confinement, animal food, and the hepatised ammonia.

The following reports marked with an asterisk
are

are copied from the patient's own journal, on account of the important information they contain.

Nov. 12.

* Continued as before; the four drops of hepatised ammonia made me as usually giddy, and having taken at different times 16 drops, my pulse was only 67 movements in the minute; slept well; no stool; took my sulphur with an increase of one tea-spoonful; did not make quite two quarts of urine during the last 24 hours, but still of the same paleness as yesterday, though of a salt taste and urinous smell.

13th.

* My urine still of a pale colour, and rather inclined to a sweet taste; made during the 24 hours two quarts; drank five half pint tumblerfuls of water, with four drops in each; slept well; perspired much; no stool; took two tea-spoonfuls of sulphur.

Note.—On the 12th I took much exercise; I also drank some tea, and for supper eat a broiled kidney, dressed with walnut catchup.

14th.

* Urine still pale, but not quite so sweet as yesterday; made two quarts during the day and night; drank only four half pint tumblerfuls of water, with
four

four drops in each of the hepatised ammonia. Am desired to leave off bread entirely.

Note.—I erred, however, by drinking beer to-day, and which I repeated on the day following.

Remarks.

As the disease seemed to have been reproduced, an entire abstinence from vegetable matter was directed on the 14th; but it appeared afterwards that he drank some beer on that day and the 15th. However, on the 16th animal food was only taken, which was to be continued without the smallest portion of vegetable matter; nothing being allowed approaching nearer to it than milk, and even this to be left off, and strong beef-tea substituted, should the disease not disappear.

17th.

* Urine of a much higher colour, and its smell and taste quite urinous; made only three pints and a half during the 24 hours; drank in the same time five half pints of water, with five drops of the hepatised ammonia in each, which occasioned me to be very sleepy and giddy towards the evening; and at that time my pulse was extremely weak, and only beat 50 movements in the minute. Had two stools.

Note.—At one time during the afternoon, by accident, I took at least from 15 to 20 drops of
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the hepatised ammonia at once, soon after which I was seized with extreme languor and giddiness.

Remarks.

These reports * point out the influence of even a slight deviation from a proper diet and confinement in reproducing the disease, and tend to confirm the explanation given of its nature, and the effects of the hepatised ammonia as a powerful narcotic in certain states of the system.

But as it is evident the disposition to the disease continues, though with, as he alleges, a diminished appetite, a pure bitter is therefore to be given, with a view of assisting the other parts of the treatment in changing the state of the stomach. The removal of the disposition must be finally accomplished by a long perseverance in the means of cure.

From the 21st to the 24th of November, he had sickness and vomiting, with griping in the bowels, resembling a common bilious attack, and for the production of which no reason could be assigned, except what might be attributed to the animal diet and the approach of an opposite state of stomach induced by it, the hepatised ammonia, and confinement. He had an emetic of ipecacuan, and the following morning a dose of castor oil. He threw up by the emetic an acid greenish matter, and the morning following the urine was evidently

dently more urinous. The acid green matter thrown up, after so entire a diet of animal food, shews the strongest disposition in the stomach to acidity. The present observation also points out the probable advantage to be derived from changing the condition of the stomach, as well as emptying its contents by the occasional use of emetics. It has been observed, that after any unusual commotion in the stomach and bowels, the urine has always been more scanty and apparently more urinous the day immediately following. As the patient has shewn a dislike to the sulphur, castor oil is in future to be substituted when he has occasion for such a medicine.

Does not the effects of the hepatised ammonia, of emetics, and in short, of whatever induces sickness or unpleasant commotions in the stomach, shew forcibly the dependence of this disease on a condition very different from that of health? Do they not shew that such a condition consists in an increased morbid action of the stomach? The affirmative of those questions is rendered still more probable when we consider the keenness and voraciousness of appetite of the patient, and the quickness of its returns. Can any thing be inferred from any supposed change in the condition of the gastric fluid? The peculiar nature of this fluid is but little understood; it is known,

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however,

however, to possess very active properties, as is shewn by its effects on the dead stomach, and the experiments of Spalanzani, &c. and if these are admitted, there can be no doubt but that it is the most efficient fluid in the body, and may, like other secretions, be liable to morbid changes, producing singular and extraordinary effects, though at present altogether unknown.

We would, on the whole, say, that the cause of our diabetic disease very probably consisted in too great an action of a morbid kind of the muscular fibres of the stomach, with the secretion of too great a quantity of the gastric fluid, and some alteration in its quality, producing, with substances capable of forming it, saccharine matter, and a certain defect in the powers of assimilation; probably depending also, in part, on too active a state of the lacteal absorbents. With this opinion we do not suppose the circumstance of food being thrown up unaltered interferes, as the great quantity so frequently eaten, prevented the stomach from getting quit of all its contents unchanged; especially as it would no doubt act in preference on those matters suiting its peculiar morbid condition. A species of indigestion, however, might be allowed, as in this disease we suppose digestion to be totally changed, from the results of the peculiar process of the stomach being so entirely different from what usually

usually occurs. For though the action of the stomach is increased, yet being morbidly so, the salutary products are neither formed or applied.

Anorexy, as depending on dyspepsy, has been alledged to consist in a diminution of the muscular action of the stomach, in a vitiated state of the gastric liquor, or in a deficiency of it. In anorexy, remedies weakening the tone of the stomach or system in general, always increase the disease; the most successful treatment (at least this is the general opinion) being by remedies giving tone and action to the stomach. In our disease, a keenness of appetite to voraciousness has always attended, except during the mere temporary disgust arising from absolute accumulation; and the changes for the better have been by those remedies which diminish the action of the system in general, and of the stomach in particular; as was shewn by the effects of confinement, blood-letting, emetics and hepatised ammonia. At one time, when the disease was apparently removed, there seemed to be, by the patient's narration, a tendency to anorexy; and on this account a bitter was given, to prevent the stomach from running too speedily into an opposite state, likely to produce a new disease.

In the second order of the Class Locales, of Dr. Cullen's Nosological Arrangement, we find the disease termed Bulimia; and the character of the third idiopathic species of it is. Bulimia (emetica)

cibum magna copia appetens, et mox per vomitum rejiciens. And this is the Bulimia Canina of Sauvage, who gives the only distinct, though concise description of it we could find; there are, however, detached accounts of it in James's Medicinal Dictionary. To both we beg leave to refer, as our present Case bears a resemblance to it, especially in that part of it previous to the accession of Diabetes. In those accounts of Bulimia, nothing is mentioned with regard to urine; but the disease is said to terminate fatally in atrophy, dropsy, &c. Sauvage says the Bulimia Canina is owing to an acrimony of the digestive juices, and an irritability of the stomach. Absorbents or alkalies, fat meats, oils, sedatives and narcotics, are the remedies pointed out. Dr. James observes, that in Bulimia, "such medicines as mightily relax and moisten the stomach, and correct the acidity of the humour, have a peculiar virtue in taking off the sense of hunger. Of this sort are all pinguious and oleaginous things; as, fats, oils, and the extremities of animals. Thus Villanovanus relates, that a certain man, affected with this disease, eat pot-bread dipt in lees of oil; and that a woman in the like case, drank twice the melted fat of beef, with a like quantity of hot oil; and that both these patients contracted so great a loathing of food, that neither of them eat any thing for five days, and so got rid of their distempers. Narcotics, by blunting the
too

too exquisite sense of the stomach, have a virtue of moderating the Flames Canina."

Does not the Bulimia Canina resemble in its nature not only the state preceding the diabetic attack in our Case, as we have related it, but also the disease itself?

Is it not probable that the urine of the Bulimia Canina would have been found sweet, or having saccharine matter?

At any rate, the Bulimia shews an affection of the stomach very different from what is supposed in anorexy; it approximates to the nature of our disease; and to us it is of importance, as exhibiting a disease of the stomach depending on great irritability, and requiring narcotic remedies. We also suppose a changed state of the gastric fluid, and a defect of the digestive process, requiring absorbents or alkalies, and food of the most highly animalized kind.

A diet of animal food, as rancid as possible, was proposed in our Case, with the view of preventing the formation of sugar in the stomach; and by that means to remove the peculiar stimulus which supported the increased action of the kidneys. The kali sulphuratum, it was supposed, would not only tend to diminish the too great action of the organs of digestion, but likewise chemically counteract the formation of sugar, and thus act in concert with rancid and fat animal

food ; but the hepatised ammonia, for reasons formerly mentioned, is now preferred, as the most certain and active medicine.

26th.

* Urine quite natural, and the quantity during the day and night not exceeding three half pints. My thirst quite allayed, not having even the desire to drink, which I recollect to have had previous to the attack of the Diabetes. Drank three wine glassfuls of an infusion of quassia with mineral alkali ; and I feel in every respect, except that of weakness in my limbs, in good health.

Remarks.

A portion of this day's urine was examined ; it was found high coloured, very urinous in smell, having a bitterish and saltish taste without sweetness, and depositing a slight gritty and reddish sediment. Dr. *Wittman* evaporated a portion of it, and he assured me no sensible saccharine matter was discoverable in the residuum, by either smell or taste.

The daily accounts which follow, marked with the asterisk, are also from the patient's own journal ; and they shew the same circumstances as those related ; but being, if possible, more distinct, and more strongly corroborating our opinion of the disease, they are continued.

27th.

27th.

* Urine less in quantity than yesterday by half a pint—did not make any during the night, but made a half pint tumblerful when I got up in the morning, which was quite urinous. Drank during the 24 hours two half pint tumblerfuls of water with hepatised ammonia. Had a good stool. Continued the bitter.

28th.

* Made three pints of urine during this day and night. Drank in the same time two tumblerfuls of water with hepatised ammonia. Had a good stool. I walked this day more than usual, went down to the Warren and was weighed (the result of which has been already given). In my return home purchased some apples, and eat a large one. Continued the bitter.

29th.

* My urine increased to very near a quart, and of a paler colour (a portion of this was evaporated, and it yielded a saccharine matter resembling honey). I went to London, where I drank some coffee and eat a Shrewsbury cake, and returned to Woolwich to dinner. Drank two tumblerfuls of water, with hepatised ammonia. Had a good stool. One of the sores on my loins healed up, the other healing.

Remarks.

It may be here remarked, that the progress of the case has justified our second primary inference, namely, that the saccharine matter proved a new and peculiar stimulus to the kidneys, and increased their action. For it has appeared that the decrease in the quantity of urine has been in proportion to that of the saccharine matter; and hence a corresponding diminution of the action of the kidneys. But if, as we suggested in our fourth inference, a change of structure in the kidneys, of a nature different from mere enlargement of vessels, had taken place, perhaps the diminution of urine would not have been so speedy and determined. It remains, however, still to be ascertained whether any peculiar condition of kidneys has been formed by the disease. So far as we have as yet gone, it does not appear probable.

Besides the increase of kidney action from the saccharine matter, there may have been, in our case, an effect producing increase of action from sympathy with the stomach, which is not unusual in other cases of disease, and it even occurs in health, when the stomach is under the influence of a stimulus, as of wine.

30th.

* Made only one pint of urine during the day and night, its smell urinous, but of a paler colour,
and

and rather of a sweetish taste. Walked as on the 28th. Drank two half pint tumblerfuls of water, with the drops. Continued my bitter. Eat an apple.

December 1st.

* Made one pint and a half of urine during the day and night, its taste quite salt, but of a pale colour. Drank in the same time only one tumblerful of water, with four drops of the hepatised ammonia. Took my alkali in milk, and the bitter medicine. Had a good stool. Eat hare for dinner, with some of its stuffing, which consisted of bread and parsley.

2^d.

* Made the same quantity of urine, which had the same colour and taste as yesterday. Eat bread and cheese after dinner, and drank a tumblerful of beer. Took the bitters and hepatised ammonia as usual.

3^d.

* The same quantity of urine, and of the same sensible qualities as yesterday. I also eat bread and cheese, and drank beer.

4th.

* Made a quart of urine, of the same quality as yesterday. I eat bread which had been soaked under roast mutton; I also eat bread and cheese, and drank two small mugs of beer.

5th.

5th.

* My urine as yesterday. Eat animal food only; took an emetic of ipecacuan in the evening, which made me very sick, and I brought up all I had eaten in the course of the day; and in the last puke the matter was very four.

6th.

* Urine since last night not exceeding a pint and a quarter, high coloured, very urinous in smell, and depositing a reddish sand. Continued my bitter, alkali in milk, and the hepatised ammonia.

Remarks.

The patient was strongly remonstrated with, and told the consequence of repeated deviations, in probably fixing the disposition to the disease so firmly as not only to increase the difficulty, but to establish the impracticability of removing it. Fair promises were therefore renewed, and absolute confinement to the house, entire animal food, and the hepatised ammonia as before, with the quassia infusion, were prescribed and agreed upon. The urine continued pale, though salt, and of an urinous smell; but on Sunday the 4th December, the urine had a doubtful smell, and some of it being evaporated, yielded a residuum evidently saccharine, though much less so than in the first experiment, the urinous salts being now more predominant.

dominant. We were in some difficulty; it was suggested that a portion of the apples might be still in his stomach, as it had not been unusual for him to throw up matters unaltered several days after they had been taken in: at this time we were unacquainted with the vegetable matter eaten and drank the four first days of December, as the reports were not received from him until afterwards. It was resolved to give him on the 5th an emetic. On this being proposed to him an aversion was signified; and he acknowledged having taken vegetable matter in bread and small beer for the four days preceding. The emetic was, however, given in the evening, and the contents thrown up, appeared to be chiefly what had been eaten the same day. So far the emetic marked a favourable change in the state of digestion. It was now judged necessary to point out in stronger language the impropriety of such deviations; and there is more reason to expect, from the apparent result, that a correct steadiness will be the consequence.

The four matter thrown up by the emetic, shews the strong disposition in the stomach to acidity, (see the remarks following the 17th November), and the high colour and deposition of the urine shews probably the same thing, as it has been observed by others (Mr. Forbes on Gout and Gravel, and Dr. Wilson on Gravel and Dyspepsy) that
such

such high colour and depofition were augmented if not produced by vegetable and acid diet; and that when founnefs prevailed fenfibly in the ftomach, the depofition of fand matter was always more abundant; hence the formation of calculous complaints, and even gout has been explained as depending on a dyspeptic ftate of the ftomach. I have been told, however, by one individual who may be relied on, that when he is fenfible of acidity in his ftomach, his urine is always clear, and depofits no fand or reddifh fediment.

The founnefs or acidity difcoverable in our patient's ftomach, after fo long an ufe of animal food, points out a condition of the ftomach unfavourable to the putrefaction of animal food. Doctor Fordyce fays, in his Effay on Digestion, that in a ftomach not in perfect force, animal food will putrify, although in a ftomach in perfect force, not only putrefaction will not go on, but will be even flopped, and the appearance of it destroyed. With a ftomach therefore in perfect force, a Laplander may live on rein-deer alone for the moft part of the year, without any portion of vegetable food. So may the inhabitants of Orange River, in Africa, on limpets, dead and putrid feals and whales, without tafing a particle of vegetable food excepting aromatics. And fo might the inhabitants of this country live (as they did three centuries ago, at leaft fix months in the year) on animal

mal food, without any other vegetable substance than farinaceous matter. And all be exempted from scurvy or any other detriment: P. 154 & 175.

Nine ounces troy weight of the last day's urine were evaporated by Mr. *Cruikshank*, and it yielded (of a matter the same in consistence as that of the experiment of the 16th October, but not so tenacious) five drachms, which was of a urinous smell and taste, and did not impart any sensible impression of the existence of saccharine matter. It seemed to have very little difference in smell or appearance, except in being more tenacious, from the residuum of nine ounces of my own urine, which weighed $3\frac{1}{2}$ drachms, a quantity less than the other by $1\frac{1}{2}$ drachm. If, therefore, we multiply our patient's urinary residuum by four, it gives two ounces and a half as the result of 36 ounces, which is five drachms less than was afforded by the same quantity of urine in the experiment of the 16th October, and of course approaches more nearly to the amount of the residuum of healthy urine.

A portion of the residuum of our patient's urine and mine were separately treated by Mr. *Cruikshank* with nitrous acid; but the honey-like matter formed in the experiment of the 16th October, was not produced; the results of both being very sharply acid and bitter, and apparently containing nothing but phosphoric salts, and nitrate of lime; though

though in examining afterwards the small portions which remained after evaporation, a little oxalic acid was detected in that of our patient; but this might have been produced by animal mucilage, and of course does not prove the presence of saccharine matter or vegetable mucilage.

A portion of this residuum was treated in a different manner, by being exposed to heat in a coated retort. The products obtained were much carbonate of ammonia, a little animal oil, and what remained in the retort had every appearance of animal coal, being difficult to incinerate, and leaving nothing but a very small quantity of the phosphats of lime and soda. Had there been any quantity of vegetable mucilage, or sugar, the syrupous or pyro-mucous acid would have been obtained, at least in the first products, and the residuary coal afforded potash.

May not the high colour of our patient's urine on the 6th December, and its more urinous appearance, depend on the operation of the emetic, as well as on the correctness of eating yesterday? For it has been observed during the disease, that the urine was always more natural after any derangement of the stomach; and does not this, with all the other striking phenomena which have been described as existing at the commencement of the treatment, or during its course, demonstrate that the primary seat of the disease is in the organs of digestion

digestion and assimilation, depending on an increased morbid action of the stomach, &c.?

7th.

* Made no urine during this day, except about a wine glassful, nauseously salt and urinous. By mistake I took a greater number of drops of the hepatised ammonia, in a tumblerful of water, than I was directed. The effect was instantaneous, in producing a severe pain and shooting in my head, which continued for three hours. Doctor Rollo called about eight o'clock in the evening, when my headach was nearly gone; but my pulse was then only 60 in a minute. On going to bed, and on getting up in the morning of the 8th, I made urine; at both times the quantity did not exceed a pint and a half; was of a strong urinous smell, high coloured, and deposited a great quantity of sandy matter. My appetite is very good, and as my diet is confined to animal food, I never find myself satisfied after eating. I take my alkali and bitter.

Remarks.

The patient's feeling of not being satisfied with what he eats, marking still a degree of the state of stomach which we have supposed to depend on an increased secretion of the gastric fluid and muscular action of the stomach, the bitter was directed to be discontinued, and not to be repeated, unless symptoms

symptoms of the opposite state arise, that is, a state marked by anorexy.

Mr. *Cruickshank* evaporated nine ounces of urine voided last night and this morning, and it yielded of a brownish residuum, not tenacious, and of a highly urinous and animalized smell, three drachms, which is at the rate of one ounce and a half in 36 ounces of the urine; a difference of result, when compared with that obtained from the same quantity of urine of the 16th October, of one ounce and five drachms, and amounting to less than the weight of the residuum from the same quantity of my urine, by two drachms—the residuums had also as nearly as possible the same appearances.

Does not this great diminution of animal matter in the urine, when connected with the other changes marking the removal of the disease, shew that the assimilating powers are assuming, or have assumed a healthy action? This is rendered further probable, if not certain, by considering that the amount of animal and saline matter, formed and separated in 24 hours, by this day's experiment does not exceed an ounce, whereas at first he was forming and separating not less than 29 ounces during the same time; and that from the increasing fullness of countenance and firmness of flesh generally, nutrition seems to be applied. It is intended to re-weigh him, and should there
be

be an increase of weight, the fact will be established.

8th.

* Made the last 24 hours one pint and a half of urine, of the natural smell, taste, and colour, and without any of the sandy-like sediment. (Does not the want of this mark a more healthy urine and condition of stomach?) Continued the water and hepatized ammonia, and the alkali in my milk; the bitter has been laid aside.

Remarks.

On enquiry I found that the excoriation and foreness of the penis was entirely gone, but that the prepuce could not be completely retracted. The gums have lost their reddish appearance, and the teeth are firm, and without the feel of being on edge. The penis affection was, previous to the treatment, occasionally very troublesome; it seems to have been owing to the constant application of the saccharine matter, as it ceased gradually on its disappearance. Both circumstances, though apparently trifling, we hold to be of consequence, as they assist in proving the absence of the disease. But the state of the mouth was considered of more importance than the other, as strengthening the opinion of the diffusion of the saccharine matter over the system, and its removal.

9th.

Two portions of blood, of about three ounces each, were taken at eleven this forenoon from the same vein, and in a free stream. The patient was averse to the operation, and could not help declaring, that his Physician at Yarmouth had told him, when I had advised blood-letting, that unless he met with a criminal having the disease, no request or opinion could induce him to perform that operation in such a case. I answered, that he would soon return, should his duty lead him, and inform his Physician that he had been bled twice, and was cured. He then submitted without further murmuring to the operation, which was performed by Dr. *Wittman*.

The portions of blood were examined at two P. M. and both were found to have an uniform mass appearance. Each portion was covered with a very thin pellicle of coagulable lymph of a loose texture, resembling the white of an egg, except which, there was no other separation of parts exhibited. But in order to ascertain this more exactly, a penknife was plunged into different places of the portion in the second cup, or that which was last drawn, and it was found throughout of a loose texture, having no distinct separation of crassamentum and serum; indeed it appeared as one soft mass: the red part being of a dark colour. It may be necessary to observe, that the cups were placed

placed in a window fronting the north (the thermometer on the outside of a window in such an aspect was at the same time 27°): the cups, after the examination, were removed to the chimney-piece, over a good fire, to be re-examined in the evening.

From the appearance of the blood, we think it not improbable an opposite state of the system is likely to occur; though the account of the gums and teeth, as given yesterday, do not point out any advance, yet the patient will be unremittingly watched. It may be also observed, that he felt very differently to-day, after the blood-letting, to what he did on the 18th of October; he then became lighter and more chearful, whereas to-day he felt heavy and languid.

Nine o'clock P. M. re-examined the portions of blood. The surface of the blood in the second cup was found to be of a florid red, the pellicle thicker and of a tougher consistence, but without any further separation of parts, all being in one apparently connected mass. The portion of the blood first drawn, which was left untouched, was also found to be in an uniform mass, without any separation of serum; the whole was, however, much firmer than at two o'clock, and the pellicle of coagulable lymph was thicker and tougher. The blood in both, under the pellicles, was very black. The cold, therefore, may have had some influ-

ence, as the blood exhibited different appearances, though still it might be said to be in rather a dissolved state, and approaching to that of scurvy. the advance of which is rendered more probable by the languor following the operation. He is now, however, chearful, and satisfied that his disease is removed; has made no urine since the morning, nor has he any desire to void any this evening; is directed to leave off the alkali, and also the hepatised ammonia; and is to be allowed to walk out to-morrow. In a few days he will be permitted to ride gently, and to eat bread, should no circumstance intervene to prevent it.

Remarks on the Hepatized Ammonia.

Mr. *Cruikshank* says that this medicine is very easily prepared, by making a stream of pure hepatic gas pass through the aq. ammon. pur. (Ph. Lond.) until no further absorption is perceived, or until the alkali is saturated. The hepatic, or sulphurated hydrogen gas, should be obtained, for this purpose, from artificial pyrites, or sulphuret of iron, dissolved in the muriatic acid.

The easiest method of making the artificial pyrites, is to raise a piece of iron, in a smith's forge, to a white heat, and then to rub it against the end of a roll of sulphur; the iron, at this temperature, immediately combines with the sulphur, and forms
globules

globules of pyrites, which should be received into a vessel filled with water; those globules are to be reduced to powder, and introduced into the proof, to which a sufficient quantity of the muriatic acid is to be added.

The dose, to an adult, should not at first exceed five or six drops, to be given three or four times a day, and this dose to be increased, so as to produce slight giddiness; but as it is a very powerful and, in large doses, a dangerous medicine, great caution should be used in its exhibition; for the want of which our diabetic patient two or three times experienced much distress.

18th.

Captain *Meredith*, as has been related, left off the pure liquid alkali which he took in his milk, and also the hepatised ammonia on the 10th; he was likewise allowed to walk out, which he continued to do until the 12th, when he was permitted to ride on horseback; and no unfavourable change arising, but on the contrary decided marks of the removal of the disease, he was desired to-day to eat half a pound of bread as a daily allowance, and to persist in his exercise.

30th.

Since the 18th he has continued free from disease, and is now in high spirits and rapidly gaining

flesh ; his urine does not exceed two pints, and it is often under that quantity, in 24 hours, and perfectly urinous. The sore on the other loin is healed. He can now retract the prepuce completely. A flight, scabby, painful eruption has appeared on the face, in the space between the chin and under lip.

To-day he weighed 13 stone and one pound, from which, when compared with the weight of the 28th November last, it will be found that he has gained one stone and a half ; and which furnishes a convincing proof, not only of the removal of the disease, but, we trust, of the disposition to it. Cautious steps are, however, for some time to be pursued, and as our patient seems now fully sensible how much depends upon himself, we have reason to hope there will be no return of the complaint. He is advised to eat rather less animal food, and more bread, but no other alteration as yet to be permitted.

January 4th, 1797.

Captain *Meredith* continues free of complaint.

Remarks.

Should another case of Diabetes similar to this occur, we would try confinement and animal food only ; and if these did not succeed, gradually adopt the other parts of the treatment, commencing, where
the

the general action was strong, and, as in this case, accompanied with local pain, by blood-letting; but in every instance by an emetic and a dose of castor oil. In the present case we gave ipecacuan only; but perhaps the tartarised antimony might be found preferable, as it induces a greater degree of nausea, and its debilitating effects probably continue longer. The maintaining a nausea by the medicine, after vomiting, deserves a full trial, especially at the commencement of the disease. From the narcotic, independent of any other effects of the hepatised ammonia, and from the quiet nights produced by opium, we have no doubt that other narcotics, and medicines diminishing action, may prove of real utility under certain circumstances of this disease. But the preference, for the reasons formerly stated, is to be given to the hepatised ammonia. Perhaps camphor might be entitled to a trial. From the commencement of the treatment, and during its progress, we would recommend the quantity of solids and liquids daily taken, to be more accurately ascertained than was done in the present case, in order to determine with more precision, by a comparison with the urine and its contents, the changes going on in assimilation, and by that means to ascertain the return of such as are healthful.

28th.

Since the last report of the 4th, Captain *Meredith* has continued in apparent health, his appetite, &c. being natural. The eruptions about his mouth still continue, though they are now so trifling as hardly to be taken notice of. He has persevered in his diet and exercise. He is sometimes costive, which he obviates by castor oil. To-day he was weighed, and the difference was found to be seven and a half pounds more than that of the 30th December; he has therefore gained two stone since the removal of the disease. Thirty-six ounces of the urine, voided in the last 24 hours, were evaporated, and yielded one ounce, four drachms, and 20 grains, of a substance without tenacity, and of a very saline taste and urinous smell. This result gives 40 grains less than the residuum of his urine of the 7th December.

For these fourteen days past his saliva has tasted saltish, his mouth feeling as if moistened with salt and water, which is a sensation he never had before, even in health. His urine this morning was not very high coloured, it had, however, a very urinous smell, tasting pungently salt, and depositing the red sand. The quantity of urine remains as stated in the report of the 30th December, never exceeding two pints in the 24 hours.

February

February 8th.

This day he was allowed to eat potatoes, and to continue them ; he was requested to pay particular attention to his urine twice a day, and immediately to inform me should any change be produced. This, however, is not expected.

21st.

Progress from the 8th to the 20th, as communicated by the Captain himself.

* My urine quite natural, the quantity, upon an average one quart in the 24 hours—the liquids which I drink, including my milk, amounts to nearly the same quantity. The eruptions on my face not so bad since I used the nitrated mercurial ointment. I eat my bread and potatoes. I take horse and walking exercise, and find that I grow stronger. My bowels are regularly open, and my appetite seems natural and good.

He is directed to begin the use of cabbage, or greens of a similar nature, boiled onions, or salad without acid sauce ; also mustard, horse-radish, and common radish when in season ; as well as tea or coffee without sugar. The diet in other respects to be as formerly. To be allowed a little brandy, or rum and water, when he feels at any time languid, or after fatiguing exercise, having a thirst or a particular desire for such drink.

From

From the 20th to the 27th.

* My urine continues quite natural, and the quantity does not exceed a quart in the 24 hours. On the 22d, I began eating cabbage and fallading, and have continued their use daily—no change has been produced in my urine.

I weighed myself, for my own satisfaction, on the 25th, and found that I had gained nine pounds since the last time; and on the whole have acquired two stone nine pounds, since the removal of my disease.

March 15.

From the 27th February, to this date.

* Urine continues natural, and the quantity as stated in the last report.

My appetite is good, but not keen. I have no thirst; my spittle continues to have a saltish taste.

I eat greens and potatoes every day.

Remarks.

This day he was weighed, and the amount was 14 stone 9 pounds, from which take 11 stone 8 pounds, and it appears he has gained, since the removal of his disease, three stone one pound; but this still falls short of the amount of his weight before the attack of the disease; he then weighed 16 stone 8 pounds, from which take 14 stone

stone 9 pounds, his present weight, and it leaves a difference of one stone 13 pounds, to be acquired, which it is likely he will soon obtain, as he gains very fast, having added six pounds in about fifteen days.

Nine ounces of the urine (which was very salt to the taste, and of a high urinous smell) of the last 24 hours were evaporated, and yielded of a brown and pungently saline bitterish tasted matter, without tenacity, three drachms and 20 grains, which multiplied by four, gives one ounce, five drachms and 20 grains in 36 ounces of urine, an amount exceeding that of the urine of the 7th of December by one drachm and 20 grains; but amounting nearly to the residuum of my urine, as stated in the experiment of the 6th of the same month, which was one ounce and six drachms; the present experiment being only 40 grains less, and therefore very nearly the state of healthy urine, if mine may be considered as a standard.

Captain *Meredith* might, we apprehend, now eat and drink any thing with impunity; but it is recommended to him to live as he has done these last three weeks, until circumstances should arise to render any other change necessary, in order to prevent gout, as well as the chance of any diabetic return.

He was yesterday ordered on active service, to which he readily and cheerfully assented; and declared

clared that it gave him the most sensible pleasure when called upon to perform the duties of his station, in being capable of executing them, and in continuing in a state to do so, as he was now fully persuaded his health depended entirely on his personal conduct in persevering in the appropriate regimen.

With extreme pleasure we communicate the following Letters from Captain Meredith, as it shews the continuation of a full re-establishment of health; even under unfavourable circumstances in diet and exercise. We regret his return to wine, as it annihilates our prospects of the prevention of gout. We have only to hope that he will be enough guarded, to obviate another attack of Diabetes.

Ireland, Youghall, May 10, 1797.

I DID not experience the smallest fatigue by my journey from Woolwich to Plymouth, though I travelled two days and a night in the coach. I remained a month at Plymouth, where my duty was moderate, but where the civilities of my friends led me to frequent indulgencies at the table, and was tempted to drink wine, though I never exceeded a pint of port. On the 20th of April, I embarked in perfect health, and proceeded by sea to Ireland, remaining on board until the 8th instant. I was sick at sea, and frequently vomited
a fourish

a fourish matter. I disembarked on the 8th in good health, when we marched eight miles, and next day 17 miles; we have still 130 miles to go, and I shall walk every inch of the ground; for so far as we have gone, I have not been sensible of more uneasiness than what I usually experienced before my illness, after such a march. My appetite is good, but not keen; I have no thirst; sleep well; and feel every way in health. My urine never exceeds a quart in 24 hours, its colour, smell, and taste are perfectly urinous. This morning I weighed $14\frac{1}{2}$ stone.

*Laughlin's Town Camp, near
Dublin, July 4, 1797.*

IT is with the utmost satisfaction I now inform you, that my health was never better than at present. I weighed myself this morning, and found that I had gained two pounds since the last weighing. My appetite is very good and regular, and there is not the smallest symptom whatever of my late disorder. The sea is very near us, and as bathing is much the fashion, amongst the officers, I have also bathed, and I think it has increased the firmness of my flesh, and my strength. I continue drinking moderately of wine.

About the end of August following, I had an opportunity of seeing our patient at Woolwich, when

when he appeared in perfect health. His weight was 15 stone, being an increase of about $4\frac{1}{2}$ stone, from what it was at the beginning of the treatment for the disease, and $1\frac{1}{2}$ stone less than what it was previous to the attack. His urine did not exceed a quart in the 24 hours, it was high coloured, of a very urinous smell, and by evaporation yielded a dark brown residuum, without tenacity, and very deliquescent. He has not lately restricted himself in diet, but even partakes of fruit deserts, drinks wine daily, and has occasionally taken it freely.

On the 17th October, I had another Letter from Ireland, wherein Captain *Meredith* describes an attack he had of fever with delirium, arising from great exertion, and damp cold ground, which brought him into a state of imminent danger. He was bled freely, and the blood denoted violent inflammation. He recovered but slowly. His strength was much impaired, and he fell off in flesh considerably. His urine was frequently examined, but exhibited no marks of Diabetes. Of that complaint he is entirely free, and though he feared a return of it in his convalescent state, he was happy to inform me that he continued without any symptom or appearance of it.

On the 7th April, 1798, he informed me, that he continued in perfect health.

CASE II.

A GENERAL OFFICER, aged 57, was first visited on the 8th January, 1797, when I found him with the following complaints.

Excessive thirst, a foul tongue with red bright edges, and a great and constant spitting of saliva, in the form of what he terms *fixpences*, of a mawkish and sweetish, though sometimes a sourish taste—his teeth feel as on edge, are rather loose, and he has lost two; the gums are full and enlarged, and of a brighter red than natural.

His appetite is rather keen—he has no pain in his stomach, or fluttering in his belly; but he formerly had a heat in the stomach after breakfast; he has also a disagreeable sensation, sometimes amounting to pain in his loins on rising or sitting down. He is rather costive.

He makes much urine, to the quantity of ten or twelve pints in the 24 hours, to the voiding of which he has urgent propensities peculiarly distressing to him, and constantly dribbling. The urine is sweeter to the taste than Captain *Meredith's*, and it is of a lighter colour.

His skin is dry and slightly hot. Pulse 104, and rather feeble and small. His face is flushed.

His

His legs swell, particularly towards night, and are œdematous, without the least redness or itching, and the swelling is only of about four or five weeks duration.

He has been occasionally subject, for these six weeks, to a tickling cough, with some pain in the chest, which has sometimes been very troublesome to him, though at present it is so trifling that he feels very little uneasiness from it.

He appears much reduced by the complaint, and is very feeble, the exertion of getting up and down stairs being extremely fatiguing. His natural habit is spare and lean, and he is rather tall in stature; his usual weight is about 12 stone, and he thinks the last time he was weighed, when in supposed health, it amounted to 11 stone 4 pounds.

These complaints are at least of three years standing; and from some circumstances it is not unreasonable to suppose the disease has been of longer duration. He has had, for these many years, strictures in the urethra, which are now so little troublesome to him, that he has not used a bougie for some time—he, however, passes his urine in a very small stream, and often by dribblets.

His appetite has been very keen and voracious; but these last three months, though he could eat heartily, yet the desire has not been so vehement. His thirst has been also very excessive, but as the
appetite,

appetite, has been lately more supportable, the quantity of urine has varied, being never less than 10 or 12 pints, but oftener a great deal more, and the desire to pass it has always been urgent.

The disease was for some time undetected, as the very violent headaches with which he had been affected had engaged all attention, and the state of the urine was overlooked, the increase of it being supposed to depend on the quantity of liquids drank, though the headach was imagined to arise from a weakness of, or some fault in the stomach.

He has been subject to the piles, which have occasionally been very troublesome, and bled, but not lately. He never had gout or gravel.

He was in America during the American war, and very actively employed. Since that period he has been accustomed to a great deal of exercise, and always to a variety of rich food, and the best wines; and though he has rather indulged freely in both, yet not irregularly so, nor has he ever been sensible of any particular keenness in eating, although he always eat and drank heartily, as a person subjected to much exercise or labour generally does.

He has been accustomed to chew tobacco, and sometimes in pretty considerable quantities, which he still continues.

F

Has

Has the tobacco had any affect in moderating the disease, and in place of an acute termination brought it to a chronic state?

He has been under the care of Doctors Warren, and Turton; Dr. Frazer, of Bath; has consulted Dr. Marshall; and more lately Dr. Meik, of Portsmouth; indeed he came to Woolwich from his immediate charge. A variety of remedies have been used. Bitters, chalybeates, alum, terra japonica, and the last were bark and acid of vitriol. He has also taken emetics, which always relieved him.

The diet uniformly proposed and adopted, was whatever he chose, giving, however, the preference to light nutritious food. He was allowed fruit, and he drank wine, cyder, porter, and beer. His wine lately has been principally port, though he has sometimes drank old hock. His common daily quantity of wine ranging from a pint to a bottle.

Remarks.

The only variations in this Case from that of Captain *Meredith's*, seem to consist in the patient being of a greater age, the disease of longer duration; in his being free of pain at the stomach, and in having less thirst, appetite, and hectic heats; the Case giving a chronic state of the disease, while the Captain's was acute, and which probably would have

have rapidly terminated in death, had it not been in proper time, treated by the new plan of cure.

The previous habits of life in this Case differ slightly from those of the first, and appear only to consist in having naturally no remarkable appetite, though possessing a more uniform opportunity of indulgence. The appetite, however, was always such as to allow a participation of variety in food, and he probably had a greater choice of wines, a more constant use of them, and in larger quantities.

In the former Case, the quantity of spitting of saliva is not specified, but in this it is mentioned as great and constant. On enquiry further of Captain *Meredith*, he says, that his spitting was also constant, and in great quantity.

In Dyspepsia a scarcity of saliva, and a defect of spitting, is held a corresponding mark of a deficiency of the quantity of gastric fluid; if so, the increase of saliva and spitting in Diabetes may equally denote an increased quantity of it. And the mawkish, sweetish, and sourish taste of the saliva and matter of the spittle arising probably in some degree directly from the stomach, may mark the vitiated state of the gastric fluid, though it does not actually mark the nature of such vitiation.

The state of the appetite in the present Case also shews the increased action of the stomach.

And the headach, no doubt, has been, and is now, sympathetic of stomach affection.

From the duration of this disease we should suppose some change may have taken place in the kidneys, as the effect of the continued stimulus of the disease. If such change should be mere enlargement of capacity, those organs may gradually recover their natural state, at least so much so as not materially to interfere with their healthy action. In Captain *Meredith's* Case, the return of the kidneys to their apparent ordinary action was rapid and beyond expectation, and their continuing to separate the usual quantity and quality of urine, shews that such action was absolutely healthful.

However, from the previous strictures in the urethra, and probably some affection about the prostate gland, or neck of the bladder, as well as the duration of the Diabetes, our hopes, though strong in the view of removing that disease, yet they are not so, with regard to a speedy return of a healthful condition of kidney. For independently of Diabetes, affections of the urethra, as we have stated, are in general, when the complaints have been of any continuance, accompanied probably, from sympathy of parts, with such a state of the whole urinary organs as to give much distress. But we have no doubt that the cure of Diabetes will relieve the uneasiness our patient has suffered from

from this cause, for it has added much to the common grievance of an increased separation and discharge of sweet urine; the removal of which may therefore leave the parts and complaints arising from them in nearly an ordinary state, and which will only require the usual means of cure.

Should the lacteal absorbents and glands, the kidneys, or stomach itself, have undergone any morbid derangement of structure by the complaint, the restoration to perfect health will not be effected, although the peculiar disease may be removed.

The patient's extreme weakness, and the accession of the œdematous swellings of the feet and legs denote the advance of what has been described as the last stage of the disease.

On the whole, our prospects are not very sanguine, so far as the perfect restoration of health is concerned, and though from the experience of the former Case we are satisfied the saccharine matter and morbid action of the stomach may be removed, yet the sequelæ of the disease may be such as to prevent the return of perfect health.

January 9th.

Mr. *Cruickshank* visited the patient with me this morning, and we agreed to commence the radical treatment as pointed out in Captain *Meredith's* Case. An emetic of ipecacuan was therefore ordered in the evening, and a dose of castor oil next

morning, with the adoption of the subsequent regimen.

The disease being of so long a duration, the patient so advanced in age, and there being no remarkable pain of the stomach or loins, blood-letting was not performed; though we should have wished to have seen a little of the blood, in order to have observed and compared its appearances, especially in a disease where, from its continuance, and the greater sweetness of the urine, it was probable more sensible sweetness might have been found in the serum.

The Regimen.

Equal parts milk, and beef or mutton decoction; soft boiled eggs or oysters, for *breakfast* and *supper*.

Sausages or black puddings, made without seasoning or any vegetable matter, or brawn, for *luncheon*.

Soups made with meat only, and without seasoning, or any vegetable matter, fat beef, mutton, pork, or game, which have been sometime killed; salmon, or eels, for *dinner*.

No seasoning, or condiment of any kind to be used, except a little salt.

For common drink, water which has been boiled, milk and water, or the decoction of beef or mutton—which is to be thus prepared; take three pounds

pounds of fat beef or mutton, and boil them with four quarts of water until reduced to one half, then strain the whole; the clear liquor is the decoction.

Whatever is eaten, or drank, to be in moderation, with rather some restraint on gratifying the appetite, and nothing to be taken but what is above specified, except when very languid and feeling the want of wine, a little brandy may be added to the water.

Absolute confinement to the house to be adopted, and as little exercise in it as possible. Living in the same room, with the windows and doors unopened, to be preferred to the frequent changing from one part of the house to another—however, a room with company in it is always to be enjoyed.

Remarks on the Regimen.

The allowance of brandy was granted more to satisfy fears entertained by the patient and his friends, than that it appeared either necessary or proper. On the contrary, it interfered a little with our views; but it was the safest thing we could allow.

The milk, though approaching to vegetable matter, and containing sugar, yet to furnish a little variety for breakfast and supper, it was allowed; but in a mixed state with fat or greasy animal decoction. Eggs and oysters were permitted on the

same principle, as it was thought necessary, in the present Case, to offer a diet which would somewhat reconcile him to the great change of living recommended; and it seemed to have its effect, as our patient entered upon it without reluctance. In other circumstances, old animal fats and meats ought to be preferred and used, as they would probably sooner remove the disease, by destroying the action of the stomach, as well as preventing the formation of sugar.

The Urine.

The quantity of urine collected in the last 24 hours, was about 10 pints; it was of a very light straw colour, of a fragrant flavor, and of a very sweet taste. Thirty-six ounces, troy-weight, were evaporated by Mr. *Cruickshank*, which yielded three ounces, one drachm and ten grains of a residuum apparently more saccharine than that of Captain *Meredith's*, and 10 grains heavier, but having the other resemblances.

Two ounces of this residuum were treated with four ounces of the nitrous acid, diluted with an equal bulk of water, and a large quantity of oxalic acid was afforded—the liquor which did not shoot into crystals had the perfect smell of honey.

A quantity of the same residuum was exposed to heat in a retort; the first product was evidently acid, but on the addition of potash the smell of ammonia

ammonia could be perceived—the last matter was manifestly alkaline, and mixed with a little empyreumatic oil. The ammonia did not come over in a disengaged form until the bottom of the retort became red hot, and the quantity on the whole was very small.

The Weight of the Body.

He weighs nine stone, four and a half pounds, and from this, compared with his last weight, when in supposed health, it appears he has lost by the disease about two stone.

10th.

Morning.—Slept more, and on the whole has had a better night than he has experienced these two years; made water only thrice, whereas he had usually done so six or seven times; the quantity about a quart, is higher coloured, cloudy, and evidently less sweet, and has a slightly urinous smell. Pulse 94; skin moist; thirst less. Has taken the castor oil, which has produced a more foetid stool than ordinary.

The emetic had operated well, but fluid and slimy matter were only thrown up, of a sourish taste; and at one time about a wine glassful of a glairy viscid matter, having a peculiarly acid taste, and which he recollects to have thrown up before during the operation of an emetic.

Drank

Drank no wine yesterday, and after dinner was not sensible of any inconvenience; on the contrary, thought he felt more comfortable. On recollection, he had not abstained a day from wine for 15 years before; and at that time, in the island of Jersey, he left it off for several months.

Evening.—Pulse as in the morning, the skin continues soft, has very little thirst, and has not made above three-fourths of a pint of urine since the morning, which has rather a wheyish than sweetish taste. Has had another stool. He feels a good deal of uneasiness in his loins, though not differing from what has usually occurred—his headach remains, though in a slighter degree.

At dinner he felt very languid, and as if he wanted wine; a spoonful of rum was given in milk.

Remarks.

The moist skin which has been induced, and which continues, shews the dependence of every symptom of this peculiar disease on the stomach.

The changes in the urine, as well as in the state of thirst and skin, following so speedily the adoption of the approximate regimen, explain more satisfactorily our views of the disease, than even Captain *Meredith's* Case, as the treatment in it was more complex—the emetics and castor oil, however, especially the former, may have had some influence.

The

The sourish taste of the whole matter thrown up, shews a state of the stomach unfavourable to animalization and putrefaction.

The glairy viscid fluid, with the peculiarly acid taste, was probably a portion of the gastric fluid in its singularly changed state.

11th.

A tolerable night, but did not sleep so much as the night before; made water in the course of it thrice, which, in appearance was higher coloured, cloudy, and of a more urinous smell, imparting no sweetish taste, and having the common saline taste of urine. Pulse 84, skin moist. To continue the diet, but to discontinue the rum or brandy, as he now feels he can do without either.

Quantity of liquids taken last 24 hours, 2½ pints.

Quantity of urine made in ditto, 2½ ditto.

12th.

A good night—the urine in appearance and quality the same as yesterday, and he can now retain it comfortably, having lost the uneasy and sudden propensity he often had to make it. Pulse 84, skin cool and soft; the flushing of the face gone. He continues more chearful, and fancies himself stronger. No stool.

Quantity of liquids, 3½ pints.

————— *urine, 3¼ ditto.*

Remarks.

Remarks.

From the quantity of urine being less than the quantity of liquids taken, exclusive of the solids, it is not unreasonable to suppose assimilation and nutrition are already going on.

The General not being in his own house, it is impossible to ascertain the ingesta and egesta completely—the liquids either way, however, is pretty accurately ascertained.

The house where the General resides is very large, the sitting, eating, and sleeping rooms, are lofty, and altogether capacious; he has constantly moved from one room to another, and his own bed room being so large, measuring $17\frac{1}{2}$ by $20\frac{1}{2}$, and 11 feet in height, gives no reason to suppose the lungs have much connection with this peculiar disease; and this is further confirmed by the sudden change produced by the appropriate diet, &c.

13th.

The night has been more restless, and in the course of it he made urine five times; it continues urinous in taste and smell, deposits a reddish cloudy matter, and has an oily substance floating on the surface. Skin cool and soft, though the pulse is 96.

Appetite yesterday and this morning keen. He expressed himself to Mr. *Cruickshank* and myself in such a way, regarding a little delay of dinner, as
betrayed

betrayed strongly the intenseness of the desire of eating, and an impatience of temper. He feels uneasy in the bowels, has taken the castor oil, but without effect; it is directed to be repeated.

Quantity of liquids, $3\frac{1}{2}$ pints.

———— — *urine*, $3\frac{3}{4}$ ditto.

Remarks.

From the increase of urine the last 24 hours, and the keenness of appetite, though the urine remains apparently destitute of sweetness, the continuance of the increased morbid action of the stomach, is clearly pointed out. We may therefore suppose, that though animal food, completely adopted, would destroy the saccharine process, it will not absolutely at the same time remove the stomach's increased action; however, a continuance of it with fats might ultimately have this effect. Recourse must be had, therefore, to the hepatised ammonia.

14th.

Has had a good night, during which he made urine three times, in sensible appearances the same as yesterday. Has had two stools of a yellow colour. Skin cool and soft, with a little moisture. Pulse 84. Appetite still keen.

Quantity of liquids, $3\frac{1}{2}$ pints.

———— — *urine*, $3\frac{3}{4}$ ditto.

Thirty-

Thirty-six ounces of this urine was evaporated, and it yielded of a residuum two ounces five drachms, having no sensibly sweet taste, but a sharp saltish one. The difference between the amount of this and the first evaporation being four drachms and ten grains.

A quantity of this residuum being exposed to heat in a retort, the first products manifestly contained ammonia, and that in such quantity as to effervesce with muriatic acid—what came over afterwards consisted of much carbonate of ammonia mixed with animal oil.

Remarks.

The good night, the urine being again diminished, and the quantity less than that of the liquids drank, shew something may have been owing to the costive state in producing the quickness of pulse, and increase of urine yesterday.

The keenness of appetite continuing, shews that the increased action of the stomach is still morbidly great, though the experiment with this day's urine points out the absence of saccharine matter. Therefore, the present state of the disease may be considered as simply bulimial; and that, the hepatised ammonia should be given and gradually increased to its fullest dose.

From the desire of returning to his family as soon as possible, we shall lose no time in adopting
fully

fully the treatment; though under different circumstances we should have tried for a longer time the effect of a diet of animal food and fats.

15th.

Has had a good night, with sleep; and when he awoke was sensible of a moisture on the skin; he made urine three times; and the whole voided in the last 24 hours had a more urinous appearance and smell, and deposited a small quantity of a reddish sediment, without clouds or oiliness on its surface. The appetite has not been quite so keen; the gums have lost their puffiness and redness; the teeth do not feel on edge, and the loose ones have become firmer in their sockets.

Pulse 92, skin cool and moist. Had a stool yesterday.

He has begun the hepatised ammonia in doses of three drops three times a day, immediately before breakfast, dinner, and supper. The number of drops to be gradually increased, until the medicine produces nausea, giddiness, and a sensible reduction of the pulse.

Quantity of liquids, 4 pints.

— urine, 3½ ditto.

16th.

A restless night from a tickling cough; made urine three or four times, which, in appearance,

was

was the same as yesterday, but not so salt to the taste; appetite not so anxious; tongue white and foul. The œdematous swelling of both legs continues, and rather most in the left. Had one stool. Skin cool and soft. Pulse 80, *as measured by my friend DR. WOOLLCOMBE, of Plymouth, who visited the patient with me to-day. He also saw Captain Meredith, and to him I am indebted for many valuable communications. He is fond of medical science, and being possessed of every necessary qualification, I have no doubt will become equally one of its improvers and ornaments.*

The hepatised ammonia has not produced sickness or giddiness, though the pulse is slower; the dose to be increased to four drops; and at bedtime, to take a draught of antimonial wine, tincture of opium, and water.

Quantity of liquids, 3½ pints.

———— — *urine, 4 ditto.*

Remarks.

Does the cough arise from accumulation in the stomach? Probably not;—but it may arise from the defect of digestion; as in æscient states of the stomach, it is exceedingly common for particular substances to disagree with it, and then an acrid sensation, imparting the actual feel of the thing previously swallowed, ascends to the throat, affects the larynx, and excites a tickling cough; this I have
often

often experienced, and as often found a few drops of laudanum and an alkali remove it.

Captain *Meredith*, about the time when great changes appeared, and a few days after the entire adoption of animal food, had an attack of a bilious nature.

The excess of urine to-day seems to point out a little difference of some kind or other in the state of the stomach.

17th.

Has had a very good night; slept comfortably, and during it made water twice; the urine in smell and appearance more urinous, and in taste more saltish than yesterday—he makes urine more freely by the urethra than usual, so as to shew that the stricture is less; the propensity and dribbling are also removed. The tickling cough is nearly gone. Has had two large foetid and lumpy stools with the castor oil. Tongue not so foul. Pulse 80; skin cool and soft.

Appetite this morning good, but not keen. The hepatised ammonia has not had any sensible effect on the stomach or head; it is therefore to be increased to five drops, and the draught repeated at bed-time.

Quantity of liquids, 4 pints.

————— urine, 3½ ditto.

G

Remarks.

Remarks.

From the large lumpy stools, it is not improbable that accumulation in the bowels may have been partly the cause of the cough and restlessness, though both were relieved by the opiate draught.

18th.

A tolerable night, had one stool, and several yesterday, which were offensive and accompanied with griping; made urine once in the night, which continues high coloured, with a reddish deposition. Has had a little headach, with inclination to sleep, and nausea, and has less desire for food. Pulse 86; skin cool and moist.

As the hepatised ammonia is evidently producing its effects, the dose is to be diminished to three drops. The draught at bed-time to be repeated with a few drops more of the tincture of opium.

Quantity of liquids, $3\frac{3}{4}$ pints.

——— *urine, $2\frac{1}{2}$ ditto.*

Remarks.

The urine so suddenly diminishing in quantity, in a disease of such continuance, and where the action of the kidneys has been so much increased, demonstrates how readily they may reassume healthy action, when the stimulus and sympathy, maintaining their increased action, are removed.

Captain

Captain *Meredith's* Case clearly evinces, that the kidneys were not deranged in structure, and that even their vessels were so little dilated that they could speedily recover themselves.

In the present Case, it may be supposed, from the age of the patient, and continuance of the disease, that the state of the vessels of the kidneys, if enlarged or otherwise affected, will require time to recover the healthy and natural condition. It is possible they may never entirely recover it. However, from the present circumstances of the Case, it is extremely probable they may.

19th.

A very good night, and in the course of it made water twice, which was of the same appearance as yesterday, except in having an oiliness on the surface. He has a nausea, and rather a disinclination for food; his tongue is foul, and there is a bitterish taste in the mouth. Breath offensive. He is drowsy, has a little headach, and appears disinclined to any kind or degree of exertion. Pulse 84; skin cool and soft.

The hepatised ammonia was discontinued last night, as the headach, with a confusion of the head, as he termed it, were considerable. It has not been taken this morning, and is to be discontinued for this day.

An emetic of ipecacuan is directed to be taken in the evening, and the draught at bed-time.

Quantity of liquids, $3\frac{1}{4}$ pints.

———— — *urine*, $2\frac{1}{2}$ ditto.

Remarks.

The urine continuing so urinous, and so considerably diminished these two days, and the disinclination to food marking a less active state of stomach, there is reason to suppose the disease is nearly removed. From the oily appearance on the urine, the offensive breath, and disinclination to motion, the disease may run, if not prevented by a change of measures, into scurvy.

20th.

A tolerable night; slept and perspired generally towards the morning; made urine twice in the course of the night, which was of the same appearance, except in there being no oiliness on the surface, as yesterday. Pulse 80; skin cool and soft, tongue cleaner; has still a little of the tickling cough.

The emetic brought up a quantity of viscid glairy matter, of a sourish taste; no portion of food was ejected; the operation was followed by two copious stools, one of which was lumpy, and both were black and offensive. The painful sensation and weariness of the back has not been perceptible these four days.

The

The draught to be repeated at bed-time with the quantity of tincture of opium augmented.

As the day is very fine, he is directed to walk out a little, and to-morrow to ride out a few miles in a chaise.

Quantity of liquids taken, $3\frac{1}{4}$ pints.

———— — *urine made, 3 ditto.*

Remarks.

The effect of the emetic shews the presence of acidity still in the stomach, and the viscid glairy matter was probably part of the gastric fluid, which may be also still in too great a quantity, and in an altered state.

Should another Case of Diabetes fall under our care, we would, at the commencement of the treatment, enjoin abstinence as long as it could be endured, then give an emetic, and have the glairy viscid fluid thrown up subjected to chemical experiment, by which its nature might be somewhat ascertained.

21st.

Has had a tolerable good night, though the cough was occasionally troublesome; in the course of it he made water three times, which continues apparently urinous, but is without the oily scum. Had a considerable headach yesterday evening, but it is for the present gone. Eat breakfast without appetite; on the contrary he expresses himself as

having a disinclination for food, and rather loathes it ; no thirst. Pulse, as examined by Dr. *Woollcombe*, 86 ; skin soft, and rather moist.

The draught to be changed at bed-time for one composed of the camphorated julep, and the tincture of opium.

Desired to continue the diet as usual, but without giving any preference to fat, unless solicited by inclination. To ride out in a chaise.

Liquids taken, 2½ pints.

Urine made, 3 ditto.

Thirty-six ounces of this urine were evaporated, which yielded one ounce, seven drachms and 20 grains of a residuum, having a saline bitterish taste, with some tenacity, and the smell was highly offensive and urinous.

Remarks.

The state of the stomach, as described to-day, points out the accession of a very opposite one to that on which the disease depends.

Considering the age of our patient, and the continuance of the disease as tending to wear out his habit, the treatment must now be speedily, though gradually changed.

The first step is exercise in the air, the next will be the use of bread.

The result of the evaporation of a portion of the last day's urine, connected with the state of the
stomach,

stomach, is conclusive as to the removal of the Diabetes, and the disposition to assimilation and health.

The changes in the quantity of the residuum in the different experiments is extraordinary, as being so quickly produced.

	oz.	dr.	grs.
The urine of the 9th yielded	3	1	10
of the 14th ditto	2	5	10
of the 21st ditto	1	7	20

The difference between the last and the first being no less than 1 oz. 1 dr. and 50 grains. On comparing this with the result of Captain *Meredith's* urine, it will be found, that a similar quantity produced 1 oz. and 4 drachms, a difference of 3 drachms and 20 grains only. It may also be observed, that comparing it with the residuum of my urine, (see the same Case, December 6.) there is only a difference in weight of 1 dr. and 20 grains in the same quantity; therefore our patient's urine of to-day differs little from healthy urine in the amount of the matter yielded on evaporation, and as the experiment has shewn, of a matter nearly similar.

A patient of 57, with a disease of upwards of three years continuance, commencing a treatment which in twelve days produced such appearances, as to justify the hope of a very rapid restoration of health, exhibits an example not commonly met with in the practice of medicine.

22d.

A good night, cough not being troublesome; made urine twice, of a natural colour and smell; has had less headach. Eat breakfast this morning with an appetite. Pulse 92, but skin soft and moist. Has had a large black stool.

The ride yesterday continued three hours, and was extended above 12 miles, which was much further than intended; however he bore it tolerably.

The draught to be omitted; and to persist in the animal food diet, but to select the articles agreeable to inclination.

Liquids taken, 2½ pints.

Urine made, 2 ditto.

Remarks.

The appearances of to-day corroborate our hopes of a speedy restoration of health; they mark, for the present, the absence of the disease.

The oily scum on the urine having disappeared, and there being less disinclination to eat, point out a disposition favourable to returning health; but it must be restrained by cautious management, and kept at the healthful standard. Much, indeed all, will here depend on the patient's steadiness.

23d.

Cough troublesome in the night; made water twice. Pulse 84, skin soft; no thirst. Felt very comfortable after the ride yesterday.

The

The mutton and beef decoction to be omitted, and to take the milk alone. The draught to be repeated at bed-time.

Liquids taken, $3\frac{1}{4}$ pints.

Urine made, $2\frac{1}{2}$ ditto.

24th.

A good night; the cough began as usual, but soon ceased after taking the draught; during the night made water twice, which was of the same urinous appearance. Had two stools yesterday by the castor oil, and two loose ones this morning without any medicine. Pulse 80; skin cool and soft; the countenance assumes a healthy aspect, and looks fuller; he is sensible of more strength. The swelling of the legs is diminished. Rode in an open carriage yesterday. The draught to be repeated.

Liquids taken, $3\frac{1}{4}$ pints.

Urine made, $2\frac{1}{4}$ ditto.

25th.

An easy night, and in the course of it made water thrice. Pulse 80; skin cool and soft. A short ride yesterday. In place of the draught at bed-time, to take two tea-spoonfuls of the camphorated tincture of opium in a wine glassful of water.

Liquids taken, $3\frac{1}{2}$ pints.

Urine made, $2\frac{1}{2}$ ditto.

26th.

26th.

The cough troublesome in the night, and is still so this morning; to take a tea-spoonful of the camphorated tincture of opium every three or four hours, and three at night; there is no expectoration with the cough; he says it is dry and tickling. A natural looking stool this morning. Rode yesterday.

Liquids taken, 3 pints.

Urine made, 2½ ditto.

Remarks.

The urine continuing in a quantity not exceeding what usually occurs in ordinary health, the uneasiness and weariness of the back not returning, the propensity to make water, and the dribbling, having some time ceased, and the urine being voided in a freer stream, point out two circumstances of great consequence to the future prospects of our patient, and convey to us great satisfaction. They shew the kidneys have not been so deranged, but that a healthful condition of them may return, which in a certain degree has already taken place, and that in a little time it is reasonable to expect they will not only become completely so, but remain. They also lead to a well-grounded hope that the previous affection of the urethra will not be so distressing as might have been imagined. (See remarks on the 8th and 18th.)

27th.

27th.

Has had a very good night, the cough not being troublesome. Has had a dark coloured stool. Pulse 78; skin cool and soft; the swelling of the legs gone. He expresses a strong desire for bread; to be allowed it to-morrow, in the quantity of two ounces at breakfast, luncheon, dinner and supper.

To repeat the camphorated tincture of opium.

Liquids taken, $3\frac{1}{4}$ pints.

Urine made, $2\frac{3}{4}$ ditto.

28th.

A very good night, and during it made water thrice, tongue clean, and of rather a bright red colour; began the bread this morning, and eat his breakfast with a good appetite. Pulse 84; skin cool and soft. To take his medicine as usual at bed-time.

He weighed 9 stone, 5 pound 2 ounces to-day, having gained 10 ounces.

Liquids taken, 3 pints.

Urine made, $2\frac{3}{4}$ ditto.

Thirty-six ounces of this urine were evaporated, which yielded a residuum weighing 2 ounces 5 drachms, being an increase since the last experiment of 5 drachms 40 grains; and the residuum, though of a very offensive urinous smell, with a bitter saline taste, and without sweetness, had a treacly appearance, and was tenacious.

Half an ounce of this residuum was introduced
into

into a glass vessel, to which was added half an ounce of concentrated nitrous acid, diluted with a little more than an equal quantity of water, a violent effervescence took place, and much nitrous gas was disengaged; after the action had ceased, and the mixture become cold, it was found to have deposited a great quantity of slender shining scales, resembling the acid of borax. (See Experiments on Urine, by Mr. Cruickshank.)

Remarks.

Such an increase in the quantity of animal matter separated by the urine, being so much greater than the result of the experiment of the urine of the 21st, only seven days since, (though no saccharine matter has been found) marks some change in the stomach, and we have probably been deceived. A simple increase of action by brandy and water, or eating something improper, though not amounting to the actual reproduction of saccharine matter, may be the causes; however, nothing has been detected, except what the urinous residuum has shewn.

The redness of the tongue, as noticed in this day's report, and the appetite for breakfast, denoted a state of stomach rather inauspicious.

The difference of weight is somewhat favourable to the idea of returning assimilation and nutrition, but it is less than we expected.

29th.

29th.

On the whole has had a tolerable good night, but awoke with a dribbling of urine, which surprised and affected him, as putting him in mind of his wonted distress. The urine is light coloured, and sensibly sweetish. Appetite yesterday good and rather keen; tongue of a florid red; some thirst, and a return of the spitting. Pulse 86; skin cool and soft.

Eat yesterday mutton hashed with onion and cabbage pickle, and his allowance of half a pound of bread. On enquiry, it was found he had eaten on the 26th minced veal, thickened with flour, and some hashed hare; any further use of vegetable matter, or the use of brandy or rum, was not acknowledged, though suspected.

The bread and every species of vegetable matter to be laid aside, and to use the animal food and fats, as at first strictly directed; he is also to take three drops of the hepatised ammonia four times a day as formerly, and to confine himself to the house. The camphorated tincture of opium to be repeated at bed-time.

Liquids taken, 4 pints.

Urine made, 4 $\frac{1}{4}$ ditto.

Remarks.

From this day's report it will be seen, that we were too sanguine in our expectations, with regard

gard to the speedy restoration of health. The disease has been reproduced, and, as in Captain *Meredith's* Case, evidently by a deviation from the animal food to vegetable matter, though probably with the addition of something else, could it have been ascertained.

Such deviations, however, would not probably have reproduced the disease, had the increased action of the stomach, or the disposition to its return been removed.

An important theoretical, as well as practical point, is completely established by this reproduction, namely, that the disease depends on an increased morbid action of the stomach, and that the removal of this, as well as the prohibition of food or drink capable of affording saccharine matter, constitutes the principles of rational and successful treatment. To prevent then the formation of sugar, and to remove the morbid action of the stomach, were the objects of the practice directed this day.

The return of the disease also confirms our former suppositions, viz. that the increase of the quantity of urine depends on the peculiar stimulus of the saccharine matter, and on a sympathetic affection of the stomach with the kidneys, when its action is morbidly increased.

It likewise serves to shew, that the floridness of the tongue, and spitting, seem criterions of the state of the stomach, and gastric fluid, as they have
returned

returned with the disorder; and that the lungs and skin have probably little or no share in the complaint.

The importance of a chemical examination of the urine, in ascertaining correctly the state of the disease, has become evident, and ought never to be dispensed with. But as every medical man may not be sufficiently chemical, or have the advantages we have had of the co-operation of an expert and intelligent chemist, we would recommend the simple evaporation of the urine at the commencement of the treatment, and of the same process frequently during its progress; for in this way a tolerably accurate state of the complaint, or convalescence from it, may be obtained.

30th.

Has had a good night, and during it made water thrice, with less dribbling; the urine is not sensibly sweet this morning, and it has a sandy deposition. Had a stool yesterday, and one this morning. He is thirsty, with a foul tongue and slight sickness, and felt his appetite for breakfast rather less than for some mornings past. Pulse 84. Skin moist.

To continue the hepatised ammonia, diet, and medicine, at bed-time.

Liquids taken, $4\frac{1}{4}$ pints.

Urine made, $3\frac{1}{4}$ ditto.

Remarks.

Remarks.

The very sensible diminution of the urine in the last 24 hours, especially when it is considered that the quantity is less than the quantity of liquids drank, and that the properties of it are evidently changed, with the alteration in the state of the appetite and tongue, illustrates the nature of our disease.

31st.

A tolerable night; tongue moist; no thirst to-day; the spitting, however, continues; skin cool and soft; pulse 86. The urine is high coloured, very salt in taste, and deposits more of the lateritious sediment. He now takes four drops of the hepatised ammonia as a dose. To continue his diet, and medicine at bed-time.

Liquids drank, 4 pints.

Urine made, 3 $\frac{1}{4}$ ditto.

February 1st.

An easy night. Has had two stools with castor oil. Urine as yesterday, which smells of hepatic gas. Complains of nausea and headach. Pulse 86. He takes five drops of the hepatised ammonia as a dose. The diet and other medicine to be repeated.

External pressure gives pain to the stomach, where he has occasionally a dull heavy sensation, as of a weight acting on it. For some time past
he

he has been sensible of a foreness on touching the belly, and in the situation of the stomach especially : but he would not have thought of either had I not enquired, and pressed this morning on the region of the stomach with my hand.

Liquids drank, $4\frac{1}{4}$ pints.

Urine made, $3\frac{3}{4}$ ditto.

Remarks.

Suspecting the existence, in this Case, of enlarged lacteal absorbent glands, or some alteration in the stomach's structure, generally or partially, from the long continuance of the disease, I, for the first time, examined, by pressure, the stomach and belly, and there seems reason to imagine the suspicion may be well-founded. Not, however, that we suppose they will prevent the cure of the disease, as we have already witnessed its removal, but they certainly may prevent the entire re-establishment of his former health.

Should the stomach be morbidly changed in its structure, it must probably be general, at least there is no symptom of its being about the pylorus or cardia particularly, though the sensibility of the latter may be increased. May not the pancreas be morbidly deranged? Dissection has noticed only mesenteric glands as being enlarged, and some change from the natural appearance in the
H kidneys.

kidneys. The whole, however, may be set down as the sequelæ of the primary affection of the stomach.

The tickling cough which he now has, and has had for some time past, may probably depend on some affection of bronchial vessels and glands, produced by the continuance of the disease.

Though some change in the structure of the kidneys might likewise in this case have been supposed, yet from the cessation of uneasiness in the loins, and the diminution of urine at one time to two pints, we may deem it probable, that there is no affection of them but what may be gradually removed.

2d.

A very good night; made water twice, of the same colour, but much falter in taste, and depositing the red sand; it does not smell of the hepatic gas. Has had a large stool. Eat his breakfast with less relish, and has a slight nausea. Skin cool and soft. Pulse 100. Has just finished the writing of some letters; in a quarter of an hour after the pulse fell to 80. Takes six drops of the hepatised ammonia three times a day; the diet and camphorated tincture of opium, in the dose of four tea-spoonfuls, to be continued at bed-time.

Liquids drank, $2\frac{3}{4}$ pints.

Urine made, $2\frac{1}{4}$ ditto.

Remarks.

Remarks.

The increase of the pulse under the circumstances in which it arose, marks a very irritable and susceptible habit.

3d.

A good night and very little cough; urine very salt in taste, high coloured, and deposits more sand. Eat his breakfast without dislike, and has no nausea; spits less; has no thirst, and the dribbling is gone; swelling of the feet hardly perceptible. Had four stools yesterday, with griping, which still continues. Pulse 80; skin cool and soft.

On handling the region of the stomach this morning, as I found him in bed, he felt a soreness, which he was also sensible of on pressing the pit of the stomach.

He takes seven drops of the hepatised ammonia, and continues his other medicine.

Liquids drank, 1 $\frac{3}{4}$ pints.

Urine made, 2 ditto.

4th.

A very good night, in the course of which he made water only once; the urine is high-coloured, smells strongly, and deposits much sand, which forms a crust on the bottom and sides of the vessel.

The tongue has lost its redness, and acquired a general pale colour; cough much less; pulse 72;

H 2

skin

skin cool and moist. He disliked breakfast, has a slight griping, and had two stools yesterday. No headach, but feels a little giddy and drowsy.

Takes eight drops of the hepatised ammonia. Expressed a wish for cheese; which was allowed.

Liquids drank, $2\frac{1}{4}$ pints.

Urine made, 2 ditto.

Remarks.

The appearance of the urine, and its diminution to about the natural quantity, for three days past, the state of the tongue this morning, and the fall in the frequency of pulse, point out the approach to a state of stomach favourable to the entire removal of the disease; the only untoward circumstance remaining, is the still existing desire for food, or rather in having no aversion to it.

5th.

An indifferent night from the tickling cough; during which he made water once; had three stools this morning with castor oil. The urine of the last 24 hours high coloured, having the sandy sediment and crust, and a considerable oiliness on the surface. Takes nine drops of the hepatised ammonia. Pulse 82; skin cool and soft.

Liquids drank, 2 pints.

Urine made, 2 ditto.

Remarks.

Remarks.

The oiliness on the surface of the urine demands attention, as it always precedes or attends the opposite state of stomach to the diabetic, though it no doubt, at the same time, marks the continuance of imperfect assimilation.

6th.

A very good night; slept nearly the whole of it, and only made water once. Urine as yesterday, but has no oiliness on its surface. Had a stool of a strong hepatic smell. Pulse 80.

Eat salt fish for dinner yesterday, which excited thirst: is dissuaded from doing this again.

Takes 10 drops of the hepatised ammonia. Is directed to take a spoonful of melted mutton suet in a little of his warm milk, at breakfast, luncheon and supper. The camphorated tincture of opium to be continued and increased.

Liquids drank, 3 pints.

Urine made, 2½ ditto.

Remarks.

The absence of the oily scum from the urine, and its increased quantity, has been owing to the augmented action produced by the salt fish on the stomach, and consequent thirst.

7th.

A tolerable night. He has had five stools, with griping, since yesterday's report, all of which were offensive, but of a lighter colour than usual. From these evacuations he has not the feel of weakness which might have been expected. Complains of being very giddy and drowsy; has much nausea, and though he eat his two eggs for breakfast, it was not with his usual appetite, but on the contrary with rather a dislike to it. Pulse 80, and feeble. Skin moist in the night, and remains so this morning.

Has taken 12 drops of the hepatised ammonia, but they are to be discontinued. It was discovered that he eat some horse-radish yesterday, and he was requested not to repeat it. Continues the camphorated tincture of opium at bed-time.

Liquids drank, 2½ pints.

Urine made, 2 ditto.

NOTE.—The actual measure of urine did not exceed a pint, but the other pint was allowed for the quantity voided with the stools; and in the same manner we have constantly calculated in every instance.

Remarks.

The symptoms of this morning evidently pointing out the effects of a full dose of the hepatised ammonia, it has been discontinued; and there is reason now to hope that state of stomach has been induced,

induced, which is unfavourable for the continuance of the disease; but it must be maintained, and the only caution requisite will be to prevent it from running into an opposite condition.

8th.

Much the same as yesterday. Pulse 84, and feeble; skin cool and moist; the tongue is clean, but of a pallid colour, as are also the gums; the teeth look fallow and foul, and are disposed to fur.

Continues the diet, and medicine at bed-time.

Liquids drank, 2 pints.

Urine made, 2 ditto.

9th.

A tolerable night; made water once during the course of it. The urine the same, but has deposited more sand and crust. He is anxious about getting home.

Began again the hepatised ammonia in three drop doses, to be taken three times a day. To continue the diet, and medicine at bed-time.

Liquids taken, $2\frac{1}{4}$ pints.

Urine made, $1\frac{3}{4}$ ditto.

Remarks.

As our patient has expressed a strong wish to know when he may go home, we have ventured to promise, that the urine should be chemi-

cally examined by Mr. *Cruickshank* on the 11th, and if the result was favourable, he should be allowed to use carriage exercise again on the 12th, to continue the same diet and medicines until the 18th, when his urine should be again examined and himself weighed, and should the results justify it, to be allowed bread; and on the 25th, another weighing and examination of urine, the issue of which continuing favourable, he is to return to Portsmouth on the 26th, making a period of seven weeks from his arrival here.

We have thought it proper to state this arrangement as connected with prognostic, though arising from the solicitude of the patient.

10th.

The same as on the 9th. Pulse 76. A stool of a light yellow cast. Continues the hepatised ammonia in doses of three drops; diet, and medicine at bed-time as before.

Liquids drank, $2\frac{1}{2}$ pints.

Urine made, $1\frac{3}{4}$ ditto.

11th,

A good night; had a stool of a brimstone colour and costive; pulse 84; skin rather warm, with a little flushing, just as if he had taken some warm brandy and water, which I understand he has not. The cough is more troublesome.

Takes

Takes the hepatifed ammonia four times a day, in doses ranging from three to five drops. The same diet, and medicine at bed-time.

Liquids taken, $2\frac{1}{2}$ pints.

Urine made, $2\frac{1}{2}$ ditto.

Thirty-six ounces of this urine were evaporated, which afforded 2 ounces 7 drachms and 35 grains of a dark brown residuum, of some tenacity, a very urinous smell, and a pungent, saline and bitterish taste.

A portion of this residuum was treated with an equal weight of nitrous acid, and the same scaly appearances were formed as by the experiment of the urine of the 27th and 28th of January : the scales were found to be exactly similar.

A portion of the residuum was introduced into a retort, and exposed to a graduated heat, the first portions which came over were strongly alkaline, and towards the end of the process, a quantity of concrete ammonia sublimed into the neck of the retort.

Remarks.

The very light colour of the stools, for these two days, points out some kind of change in the digestive process.

The quantity of urine is three gills more than yesterday, and the pulse is increased eight pulsations in the minute; there is also a flushing and more than usual heat.

Though

Though the residuum of this day's urine, obtained by evaporation, has been found to contain no saccharine matter, it shews too great a proportion of animal matter and salts, to denote healthful assimilation. The total weight of the residuum gives nearly the result of the whole of the urine voided in 24 hours; of course there is now a material difference in the daily waste, from what took place at the commencement of the treatment, as is shewn by comparing the present with the first experiment. See 9th January.

The quantity of animal matter, as produced by the evaporation of the urine of the 21st of January, being nearly that of health, furnishes a proof that the present increase of it, does not probably depend on any irremediable derangement of stomach structure, or any morbid condition of lacteal vessels and glands, produced by the continuance of the disease.

The light coloured stools, the heat and flushing, the increase in the pulse, in the quantity of urine, and the animal matter found in it, and probably, we may add, the augmentation of the cough in the afternoon, marking some change unfavourable to our prospects, our suspicions of some improper deviation were excited, but we could not obtain any satisfaction. We hinted at brandy or rum, as it had in small quantity been once allowed, but the use of neither was acknowledged, nor any other thing apparently producing the change.

As

As he is uneasy about his confinement, the riding in a carriage is to be continued; but the action of the stomach is to be further reduced by the hepatised ammonia; to assist which, as well as to alleviate the cough, a combination of opium with ipecacuan is to be given in place of the camphorated tincture of opium, in the following form:

R Pulv. Ipecac. ʒss.

Opii

Sapo Venet. a ʒi f. Pil. No. 60.

Two of which are to be taken at bed-time, and when necessary, one in the course of the day.

Though the hepatised ammonia diminishes the action of the stomach, and, in large doses, that of the whole system, yet it does not seem to possess such anodyne power as to preclude the use of opium.

12th.

A good night; made water once; has had a copious stool by castor oil this morning, of a natural appearance and colour, though rather of a lighter yellow and firmer consistence. Urine high coloured, depositing a good deal of the red sand, and has much oiliness on its surface. Pulse 84; skin cool and soft. There is a little cough since he got up, with a slight pain of the breast.

He takes the hepatised ammonia in four drop doses. The same diet. A piece of flannel smeared with

with hartshorn and oil to be applied to the breast; one of the opium pills with ipecacuan to be taken before dinner, and two at bed-time. Rode out yesterday.

Liquids drank, $2\frac{1}{2}$ pints.

Urine made, $2\frac{1}{4}$ ditto.

Remarks.

We hope the suspicion suggested yesterday will have a permanent good effect, as it seems to have already produced a change.

13th.

A very good night; no cough; neither has it returned this morning; has had a stool of the same nature. Urine in appearance as on the 12th. Pulse 84. Skin cool and soft. Rode out yesterday.

The hepatifed ammonia and pills to be continued.

Liquids drank, $2\frac{1}{2}$ pints.

Urine made, 2 ditto.

14th.

A good night; no cough; made water once; had a stool yesterday and three this morning, without castor oil, which were offensive and of a whitish colour. Urine lighter coloured and oily, smelling
of

of the fuet. Pulse 84; skin cool and soft; no thirst. Appetite neither keen or loathing. Rode out yesterday.

Continues the pills and hepatised ammonia; the mutton fuet to be omitted.

Liquids drank, $2\frac{1}{2}$ pints.

Urine made, $1\frac{3}{4}$ ditto.

Remarks.

The stools having become of a light brimstone colour since the use of the mutton fuet, and the urine being very oily to-day, and smelling of the fuet, it is omitted, to ascertain whether those appearances depend on this cause.

There is reason to suppose a deficiency of bile, from whatever cause it may proceed; for besides the light colour of the stools, there is no yellowness of the eyes, nor even that high saffron colour of urine which takes place when the bile is sufficiently secreted, but prevented from passing into the intestines.

Perhaps it is the fats which are not assimilated and run off by the urine, that gave the last increase of quantity in the residuum.

On this supposition, as his stomach is now in a sort of negative state with regard to power, other animal fats, as well as the fuet, may be discontinued. But this must remain undecided until the effects

effects of leaving off the mutton suet are perceived.

What is the state of urine in scurvy?

So far as I recollect, no chemical examination of this fluid in that disease, has been made.

15th.

A good night; made water once; urine not so oily; has had this morning three stools, of a darker and more bilious colour; feels languid; appetite the same; he is very desirous to have some brandy and water, for which indeed he has become extremely impatient, as he alledges the disease is gone, and that he never will get strength without cordials and bread. As we had our doubts that deviations had pretty frequently occurred, we thought it better to give a sanction, in hopes it might restrain, and he was allowed weak brandy and water, and in two days after was to begin with four ounces of bread daily. Pulse 84; skin cool and soft.

Fats to be avoided, and only the lean parts of meat to be eaten. The hepatised ammonia to be discontinued. The pills at bed-time to be repeated, and when he has occasion for an aperient medicine, one or two of the following pills in place of the castor oil.

R Aloes ʒij.

Sapo Venet. ʒi fi. Pil. No. xlv.

Liquids

Liquids drank, $2\frac{1}{2}$ pints.

Urine made, $1\frac{3}{4}$ ditto.

Remarks.

The change in the colour of the stools, since leaving off the mutton suet, makes it probable there was somewhat depending on its use, for which reason the other fats are directed to be avoided.

From the frequency of the stools, which our patient insists upon it weaken him, though they are of such a nature that they appear to have been necessary, the hepatised ammonia is to be discontinued, as it very likely has an effect in producing them.

Though there is reason to hope, from the long continued absence of the saccharine matter in the urine, its diminished quantity, and more natural appearance, with the negative appetite, that the changes we have been prevailed upon to adopt in the regimen will not reproduce the disease; yet had it not been for the extreme impatience of the patient to-day, we intended to have persevered some days longer before we allowed bread; and brandy or other spirits were not to be at all proposed, at least for some time to come.

Brandy, or any spirit, however, does not interfere with the principles of treatment so far as the prevention of the formation of sugar is concerned;

but

but we have always been afraid of it as tending to increase the action of the stomach ; at least one thing is certain, that spirits and water frequently increase the quantity of urine, and we fear they have been, unknown to us, operating in some degree against our measures.

It may be further observed, that Diabetes Mel-litus and Scurvy, being supposed two opposite states of disease, and requiring very different remedies, grog should rather prove a sort of remedy in the Diabetes, as Dr. Trotter has observed that it contributes to the production of Scurvy.

16th.

An uneasy night, from griping with loose stools, of which he has had four this morning, besides three yesterday afternoon, of a dark colour and offensive smell. Pulse 84; skin rather warmer than usual; no thirst or cough; urine high coloured, and depositing much sand and crust.

He is directed to take 20 drops of a mixture, consisting of two parts of the water of pure kali, and one of tincture of opium, every four hours until easier. The pills with opium and ipecacuan to be discontinued, and also the milk. To take weak brandy and water warm for drink, in the proportion of two table-spoonfuls of the former, to half a pint of the latter, or beef-tea.

Liquids

Liquids taken, 1½ pint.

Urine half a pint; but allowing for what was mixed with the stools, the whole is estimated in the 24 hours at 1½ pint.

Remarks.

Not being able to satisfy ourselves with the cause of the griping and frequent stools, except on the supposition of something improper having been eaten, and not being able to discover it, we felt some difficulty; however, on our suspicions of acidity, we gave him an alkali joined with an opiate.

In the course of the day we were informed he had eaten some fruit (shaddock) on the 14th, since the evening of which he had been griped, though this was not acknowledged until the morning of the 16th. This was an important discovery, as it explained two points, one of which was extremely essential, namely, that the disease was not only removed, but in all probability the disposition to it, as it was not reproduced by acid fruit, to which the purging, with griping, was owing; and of course the alkali with opium would soon remove it. It may, however, be suggested that this circumstance does not decidedly mark the removal of the disposition to the disease, as it only proves mere acid will not reproduce it; for it requires vegetable substances, or mucilage, to form saccharine matter. But, at any rate, the fears we had entertained of

the probable accession of a serious state of bowels, from the long continuance of the disease, were lessened. We now inferred that all our former suspicions were realized, though we had not been so fortunate, as in the present instance, of arriving at the knowledge of them.

17th.

A good night, without cough, but had two stools, and also two in the course of yesterday, with slight griping; the stools are still of a dark colour and offensive smell. Urine turbid and high-coloured. No appetite; on the contrary has a loathing of food, with flatulence, and frequent belchings, which to him are unusual. Pulse 84; skin cool and soft; feels very languid.

To continue the medicine for to-day, and brandy and water, and to begin to-morrow morning to take a table-spoonful of the following tincture three times a day, when the stomach is empty, in a small wine-glassful of water, in which has been previously mixed ten drops of the alkali with the tincture of opium.

R Tincture Columb.

Gentian Comp. a. ʒij.

To commence also with the daily use of four ounces of bread, and to be permitted mustard and horse-radish with his meat, and a little ginger and nutmeg with his brandy and water.

Liquids

Liquids taken, $1\frac{1}{2}$ pints.

Urine made, $1\frac{1}{2}$ ditto.

18th.

A good night; did not make water during the course of it, and has had only one stool since yesterday, of a natural colour and consistence, but rather more offensive. Urine of a dark yellow colour, with sediment. Pulse 80. Skin cool and soft.

To take the diet and medicines ordered. To be allowed, at his request, fouchong tea without sugar. To take an airing to-day.

Liquids drank, 2 pints.

Urine made, $1\frac{3}{4}$ ditto.

Eighteen ounces of this urine yielded a residuum of the same appearances, and sensible properties as that of the 11th of February, weighing 1 oz. 3 dr. 20 gr., which being doubled, gives 2 oz. 6 dr. 40 gr., or a drachm less, than the result of the experiment alluded to.

Remarks.

The report of to-day is extremely satisfactory. The patient has got quit not only of his bowel complaint, but we may venture to say of his disease.

The quantity of animal matter in the urine, however, is still greater than that of health, and may arise from some morbid condition of the lacteal vessels and glands, or other parts interfering

with healthful assimilation, and which may have been produced by the long continuance of the disease. But from the experiment of the 21st January, we have every reason to suppose there is nothing interfering so much with his recovery, as his own incorrectness.

19th.

A tolerable night, but had a little cough; made water twice; no stool. Urine high coloured, but deposits no sediment, and its taste is rather bitter than salt. Pulse 88; skin rather warmer than usual, and not so soft. Was out yesterday.

The bitter and diet to be continued. Desired to take less brandy to-day. Two opium pills at night.

Liquids drank, $2\frac{3}{4}$ pints.

Urine made, $2\frac{1}{2}$ ditto.

Remarks.

Our patient can hardly keep within reasonable restriction; for he has probably been exceeding or deviating the last 24 hours, as is shewn by the increase in the pulse, the warmth of skin, and the augmentation of the drink and urine.

20th.

A good night; made water twice; no stool; the urine high coloured and much saltier in taste. Pulse 86; skin cool and soft; appetite better.

The

The bitter to be discontinued ; the pills to be repeated at bed-time, and two of the aperient pills to be taken to-morrow morning. Took only one tea-spoonful of brandy yesterday, in milk, which he is to take in brandy only when he is very languid ; indeed it would be desirable could he be dissuaded from it altogether. The same diet, with fat meats, and the four ounces of bread, to be persevered in. Took an airing yesterday.

Liquids taken, 3 pints.

Urine made, 2½ ditto.

21st.

An easy night ; made water twice ; a costive stool yesterday ; urine high coloured, saltish taste, and deposits the reddish sediment. Pulse 84 ; skin cool and soft.

Rode out yesterday ; stopped on the road and drank some brandy and water.

He has taken two of the aperient pills this morning, which are to be repeated to-morrow, if necessary ; to continue the opium pills at night, and to take 30 drops of the water of pure kali in a wine-glassful of his milk morning and evening, and six drops of the hepatised ammonia every day before dinner.

Liquids drank, 3 pints.

Urine made, 3 ditto.

Remarks.

Though the urine has no saccharine appearance, yet its quantity being augmented these three days, more especially during the last 24 hours, we fear the action of the stomach is returning; and as entire dependance cannot be placed on what he eats and drinks, he has been directed to take the alkali and hepatised ammonia, as correctors and preventatives.

22d.

A good night; made water twice; the urine as yesterday; had two large stools of a deep yellow colour; appetite indifferent. Pulse 84; skin cool and soft. Rode on horseback yesterday. Continues the medicines and diet.

Liquids taken, 2 pints.

Urine made, 2 ditto.

Remarks.

The pulse keeping generally at 84, or ranging from that to 80, when apparently free of heat or thirst, with a cool soft skin, it is probable this may have been the usual standard, previous to the diabetic attack; if so, it does not at present mark any particular state. It has, however, been lower, but that only after the use of the hepatised ammonia.

23d.

An easy night; no cough; made water twice; had a large stool yesterday; he has taken an aperient

rient pill this morning. Pulse 84 ; skin cool and soft. Continues the diet and medicines. Rode out on horseback yesterday.

Liquids drank, $2\frac{1}{4}$ pints.

Urine made, $2\frac{1}{4}$ ditto.

24th.

A good night ; two stools yesterday ; urine the same appearance. Pulse 80 ; skin cool and moist. Continues the same diet and medicines.

Liquids drank, $3\frac{1}{4}$ pints.

Urine made, 3 ditto.

25th.

A good night ; little or no cough ; made water twice ; the appearance of the urine the same, but rather of a paler colour, though depositing the reddish sediment. Pulse 84 ; skin cool and soft ; tongue clean and of a pallid colour.

Liquids drank, 3 pints.

Urine made, 3 ditto.

Thirty-six ounces of this urine were evaporated, and yielded of a dark brown residuum, having some tenacity and a saline taste, but not so pungent, nor having so urinous a smell as that of the 11th or 18th of February, three ounces ; which exceeds the weight of the former by 25 grains, and of the latter by 80 grains, and is less by 70

grains than the quantity furnished from the urine previous to the commencement of the treatment.

Of this residuum half an ounce was treated with half an ounce of the nitrous acid, diluted with about twice as much distilled water, when neither the honey smell or the scaly appearances, as in the experiments of the 28th January and 11th February, were produced; on evaporating the mixture to the consistence of a very thick syrup, no scales, or crystals of oxalic acid, were formed.

A portion of the same residuum was introduced into a retort, and exposed to a graduated heat; the first portion which came over was alkaline, and towards the end of the process a quantity of carbonate of ammonia, less than in the experiment of the 11th, sublimed into the neck of the retort.

Our patient was weighed, and was found to have lost six pound since the former trial of the 28th January. To-morrow he returns home.

Remarks.

The GENERAL having lost six pounds since last weighing, and his gaining only four pounds since the commencement of the treatment, may be attributed in some measure to the bowel complaint and frequent evacuations.

The urine also points out a larger proportion of animal matter carried off by it, and off course, at present,

present, assimilation and nutrition are not equal to the production of increase of bulk.

We have on the whole to lament our patient's inclination to variety, and his extreme impatience under restrictions, as otherwise we have no doubt he would have returned in a much better state to his family. However, the Case is, to us, satisfactory, though not accompanied with complete gratification. On parting, he was told, and he acknowledged the truth of it, that every thing depended on himself; but at the same time we agreed he was not so favourable a subject for obtaining, by any management, so speedy a recovery as Captain *Meredith*.

An outline of the management was forwarded to Mr. HATCHER, *Ordinance Surgeon* at GOSPORT, with the request of attending strictly to the circumstances of the patient.

The GENERAL bore the journey very well, and arrived at Portsmouth on the 27th of February; but having eaten something improper on the road the day before, he was attacked with a bowel complaint. On the 6th of March he had a return of his bowel complaint, from eating beet root. On the 9th he had the sanction of a physician to eat what he pleased, and to drink wine. The disease was accordingly reproduced; for his urine became sweet, increased in quantity, with a return of
thirst

thirst and feverishness. On the 14th some of his urine was evaporated, and it yielded a saccharine extract of a dark brown colour, and having a little urinous smell.

Thus have our labours and hopes in this Case been frustrated. However unfortunate the termination of it may be, we are satisfied of the strength it has added to conclusions derived from our first Case, now happily finished. But of this the medical world will judge; both Cases being submitted to the examination of those who will take the trouble of reading them, and it is expected they will decide with the same faithfulness and impartiality with which they have been attended to and recorded.

From DR. TROTTER, Physician to his Majesty's Fleet.

The communications of Dr. Trotter, contain a further account of our second Case of Diabetes, subsequent to the reproduction of the disease by the use of fruits, wine, &c.; and it will be perceived, a return to our plan of treatment again removed the disease; but from another indulgence in forbidden things, the disease returned. The consequences to the patient may be readily apprehended.

Portsmouth,

Portsmouth, 27th Jan. 1797.

I BEG leave to thank you for Captain Meredith's case, which has afforded me a fund of information and entertainment.

I think with you on the subject of pneumatic medicine, and your able induction of its doctrine, in the masterly treatment of Diabetes, will give a vast support to the truths which it embraces.

3d April, 1797.

IT would have given me much pleasure to have returned you satisfactory answers to your queries concerning the urine of scorbutics; but such is the healthy condition of this fleet, from the effectual means of prevention, that scurvy has scarcely appeared for some months.

I have many objections to offer against former experiments on this subject, and I think the whole unsatisfactory. Where trials are to be made, they ought to be done in the advanced stage of the disease, and when the patient has for a day or two abstained from salted meat, and before recent vegetables are touched. The urine in scurvy is small in quantity, dark coloured, and may be called highly animalised; but its chemical properties have never been exactly ascertained.

In scurvy there is little thirst. The appetite is generally good, even for salted meat; but fresh vegetables are always highly grateful.

Emaciation

Emaciation succeeds the use of the acid fruits, when given in large quantities, in inveterate cases, and the appetite declines. I have not seen the exhibition continued longer than a cure was necessary. The urine becomes pale, and larger in quantity than the liquids taken in.

In proportion to the quantity of lemon juice taken in, sometimes in a day or two, the blood regains its florid colour: I have known this colour, during the cure, brighter than in the natural state.

Nitre dissolved in vinegar, in 152 cases, by two able navy surgeons, did not produce any favourable appearances in scurvy.

Three cases of inveterate syphilis, have been cured here by nitric acid, as described by Mr. Scott in Dr. Beddoes' last work.

I have visited your patient the GENERAL thrice. As soon as he returned to your plan of diet, the urine became natural in quality, and decreased from eight to three pints a day. Whether this relief should be permanent or not, it affords a decisive testimony of the efficacy of your practice, more especially when we consider the trial is in a case of so many years standing.

I have never known a case of Diabetes among seamen, nor have any of my naval acquaintances.

You have thus added another triumph to the pneumatic physicians, which blends with it relief to human misery hitherto incurable.

P. S.

P. S. Mr. Hatcher sends his compliments; he has just seen the GENERAL, whose urine the last 24 hours did not exceed one pint and a half.

16th April, 1797.

SINCE my last, I think the GENERAL has gained some strength, and looks better. He has diligently persevered in the animal diet, and taken as much in a venison state as he could obtain. This being the case, and all kinds of wine, and malt liquors being left off, we cannot expect that relish for food which we observe in other conditions. Of his appetite, however, there is no reason to complain; his food certainly nourishes. His pulse in the right arm is about 84, of due strength; but at the other wrist it has always been different; probably you observed this at Woolwich. A slight clamminess is felt in the mouth; but no thirst. He takes an opiate, and sleeps well; and gets out of doors this fine weather. His cough is almost gone, and he expectorates with ease. His feet are now comfortably warm, and I think the skin begins to do its office; the scurf has fallen off. To-morrow he will begin to take the following chalybeate pills.

R *Rubig. Ferri* 3*ss.*

Magnesia ust. gr. × ×

Pulv. Zinzib. gr. ×

Ol. Olivar. fi. mass. dividenda in

pil. No. ×ij—Sum. ij. ter die.

The

The GENERAL drinks a small tumbler of lime water three times a day; but as the *hydrogeno-sulphurated ammonia* rather palled the stomach, he left it off. He also drinks a little hollands, or brandy and water, being spirits free from saccharine matter.

Things being in this train, in a case of such long standing, the whole account is very flattering: suffice it to say, the patient thinks himself in paradise, compared with his former sufferings.

28th April, 1797.

IN my last I informed you that I had ordered a pill of the Rubigo Ferri for the GENERAL. There appeared strong symptoms of a different disposition of body being induced, from that which attended the discharge of the saccharine urine. The fetor of the urine had become uncommonly offensive, a very short time after voiding it. There was unusual languor and anxiety for the vinous stimulus, I therefore thought it fair to try the oxyd of iron.

The urine, however, continues much the same in quantity, and quality; but still I think, for a few days, our patient has been losing ground; and though the appetite is not so deficient, the emaciation seems to increase. He has uniformly hankered after the forbidden cup, and though he is satisfied with the idea that indulgence must be fatal, it is in vain to resist his importunities. For
two

two days past he has taken a glass and a half-ful of Madeira wine—the urine has increased some ounces beyond the usual quantity.

I am sorry that the fleet being ordered to sea will prevent me from detailing the future occurrences of this singular case. I have urged the plan to be continued, but doubt of its being carefully adhered to.

DR. TROTTER'S doubts have, we are sorry to say, been fully realised, as the following extract of a letter shews.

Portsmouth, 7th May, 1797.

THE GENERAL is gone to Portchester, to try the effects of a change of situation ; but it will be of no avail.

Since Dr. Trotter left him, he has returned to his favourite plan, and eats of every thing ; as apple-pudding, tea with sugar, &c. and drinks wine.

His urine has increased ; it has become pale, and sweetish ; his thirst is returned ; in short he has again relapsed into his disease. How much this is to be regretted !

The GENERAL died on the 18th of August following.

From the 7th of May he was under no particular plan of diet or medicine.

Three

Three weeks before his death he entirely lost his appetite, and his urine became apparently natural, and in quantity did not exceed 2 or 3 pints in 24 hours, although his food and drink, which he was coaxed to take, consisted of wine, sweet cakes, &c.

He gradually wasted, and sunk under the disease, and died without any new symptom or particular struggle. Although permission was given, on my request, to open the body, yet by some unaccountable delay, the Surgeon was obliged to decline the examination, on account, as he informed me, of the putrid state of the body.

An Abstract of the most remarkable Circumstances and Changes in the Disease, during the Progress of the Cure in both Cases.

OF CASE I.

On the 16th October, 1796, an increased action of the stomach and kidneys, and of the whole system, was apparent, and the quantity of urine seemed to exceed the quantity of drink taken by nearly one half. The plan of cure proceeded on the idea of preventing the formation of sugar in the stomach, and of removing increased action.

On the 19th, The treatment commenced, though on the 18th he was bled, and which seemed to relieve

lieve the general symptoms; the blood exhibited marks of saccharine diffusion over the system.

On the 21st, The quantity of urine was diminished one half, and a cloudiness occurred in the urine denoting some change in its quality; the thirst was also less.

On the 1st November, The urine was more sensibly changed in its qualities, and further reduced in quantity. The thirst was less, and the skin had become moist. The kali sulphuratum was left off, and the hepatised ammonia exhibited, which, taken to the quantity of 35 drops in the day, produced sickness and vomiting, with giddiness and drowfiness.

On the 4th, The urine was not sensibly sweet, and it deposited a red, sandy, or lateritious sediment.

On the 13th, A deviation in diet took place, which continued the two following days, and had the effect of reproducing the sweetness of urine.

On the 17th, An accidental large dose of the hepatised ammonia lowered the pulse, &c. and hence it appeared to possess the power of a strong narcotic in certain states of the system.

On the 26th, The quantity of urine was reduced to $1\frac{1}{2}$ pints in the 24 hours, possessing apparently, and by evaporation, properties very opposite to those met with in the disease.

From the 28th Nov. to 5th Dec. The second deviation

viation in diet happened, and the disease was again reproduced, as was evident by saccharine matter in the urine, and by the increase in the quantity voided. The quantity of liquids taken not having been accurately ascertained, nothing can be inferred from this Case as to the existence, or extent of skin absorption. The account of the Case on the 16th October, could it be fully depended upon, shews that the quantity of urine much exceeded the quantity of drink. The progress of the Case, however, did not support the same opinion.

On the 6th December, The urine was again sensibly changed in its properties, and the quantity reduced to one pint and a quarter. The chemical examination of this day's urine proved the absence of sugar, but that there was more animal matter than in health.

On the 7th, The quantity of urine did not exceed $1\frac{1}{2}$ pints, and the chemical results shewed not only the absence of sugar, but that the extractive matter in it was not more than in ordinary urine. The hepatised ammonia, in a large dose, produced its usual effects on the system. *See the 1st and 17th November.*

On the 9th, The blood drawn exhibited appearances very dissimilar from that of the 18th October.

On the 10th, The hepatised ammonia was discontinued. Exercise was permitted.

On

On the 18th, He began the use of a limited allowance of bread.

On the 30th, The restriction on the quantity of bread was taken off. He was found to have gained in weight, since the removal of the disease, $1\frac{1}{2}$ stone.

On the 8th February, 1797, As the disease seemed to be perfectly removed, and, from the salt taste of the mouth, it being probable he could bear more vegetable matter, he was allowed to add to his former diet potatoes.

On the 22d, He began the use of other vegetables, such as cabbage and sallading; and, when particularly required, was allowed to take weak brandy and water. From the 8th to this date he used potatoes daily, as well as bread, and he continues well.

March 15th. Since the 22d February he has been using various vegetables, and bread since the 18th December, being a period of three months, and he continues free from disease. His urine gave healthy results. He was found from have gained in weight, since the removal of his disease, three stone one pound.

May 10th. A return to the use of wine, and to fatiguing duty, did not reproduce the disease.

July 4th and end of August. He continued in health; had increased in weight, although he had

been continuing the use of wine, and even of sweet meats and fruits.

October 17th. An account of his having had a severe general inflammatory attack, which reduced his strength and flesh—but not the least appearance of the return of the Diabetes.

April 1798. In perfect health.

OF CASE II.

On the 8th January, 1797, The patient was first visited, and found to have the following characteristic symptoms of Diabetes Mellitus; a keenness of appetite, excessive thirst, great spitting, edges of the tongue and the gums brightly red; teeth on edge; a dry hot skin, with a quick pulse, and a discharge of a light coloured, and sweetish tasted urine, in daily quantity not less than 10 pints. The disease of at least three years duration.

On the 9th, The urine being examined, was found to contain a great proportion of saccharine, and animal matter, amounting to 3 ounces 1 drachm and 10 grains, in 36 ounces troy weight of the urine. An emetic was given.

On the 10th, The regimen, or appropriate treatment, was completely adopted.

On the 11th, The quantity of liquids drank, including

cluding every species of fluid, in the 24 hours, was $2\frac{1}{2}$ pints; the quantity of urine voided was exactly the same, and which had already assumed great changes, in apparently having lost its sweetness, and becoming more natural in colour. The diminution of quantity, and the change of quality, so speedily produced, shews not only the nature of the disease, but the decided and immediate good effects of an emetic, along with the entire abstinence from vegetable matter, and the sole use of animal food: the removal of the thirst, and the production of the moist skin, also corroborate these truths.

On the 12th, An increase in the quantity of liquids drank, and of the urine, which continued to the 18th.

On the 14th, The urine was found to contain no saccharine matter; therefore, in four days, by the use of the animal food, and abstinence from vegetables, the saccharine matter was not only prevented from being produced, but was removed from the system.

On the 15th, He began the hepatised ammonia, as it was supposed the morbid action of the stomach continued, though the saccharine process had ceased. It has been imagined, from the airiness of the rooms and house in which our patient resided, that the lungs, as well as the skin, had little or no connection with this disease. The skin, it has been seen, became moist on the third

day of the treatment, and consequently any condition of it peculiar to this complaint, must entirely depend on the stomach.

On the 18th, From the diminution of the urine to $2\frac{1}{2}$ pints, which was the quantity it had fallen to on the 11th, it was inferred, no derangement in the structure or condition of the kidneys had taken place, by the long continuance of the disease, that was likely to interfere with a return to natural and healthful action. The hepatised ammonia, in five drop doses, three times a day, producing its general effects, was diminished.

On the 20th, He began to go out and use exercise.

On the 21st, The urine, in the same proportion as on the 9th, yielded 1 ounce 7 drachms and 20 grains, being a difference in weight of 1 ounce 1 drachm and 50 grains, and contained apparently no saccharine matter.

On the 28th, Began bread. The urine was not found to contain saccharine matter, but the residuum, treated with nitrous acid, furnished a scaly like matter possessing peculiar properties.

On the 29th, A great increase of the urine to $4\frac{1}{4}$ pints, which was evidently sweetish; all vegetable matter was again discontinued, and he began the hepatised ammonia in doses of three drops, four times a day. This reproduction of the disease was clearly owing to a deviation from the
allowed

allowed diet. *See the detailed Reports and Remarks.*

On the 2d February, The urine was again reduced to $2\frac{1}{4}$ pints, and had a natural appearance, though depositing red sand.

On the 4th, Urine 2 pints in 24 hours; the pulse 72; takes 8 drops of the hepatised ammonia for a dose.

On the 7th, The hepatised ammonia had been augmented gradually to 12 drops, when, producing its full effects, it was discontinued.

On the 9th, Urine $1\frac{3}{4}$ pint in 24 hours, while the liquids amounted in the same time to $2\frac{1}{4}$ pints.

On the 11th, Urine $2\frac{1}{2}$ pints; liquids taken the same; but there was a warmth of skin, a flushing, and an increase of pulse from the preceding day, exciting the suspicion of some deviation.

On the 16th, A frequency of stools, with griping, from eating some shaddock fruit.

On the 17th, Urine reduced to $1\frac{1}{2}$ pints, the quantity of liquids taken being the same.

On the 18th, Began the daily use of four ounces of bread; with an allowance of mustard and horse-radish to his meat.

On the 19th, Urine increased to $2\frac{1}{2}$ pints, and liquids $2\frac{3}{4}$ pints.

On the 25th, The urine and liquids were equal, amounting each to 3 pints. The urine did not contain saccharine matter, but the quantity of ex-

tractive matter was increased beyond that in the former experiments, except the first on the 9th of January.

Total amount of the quantity of
liquids our patient had taken
from the 11th January to the
25th February - - - - 131½ pints.

Total amount of the quantity of
urine discharged in the same
period - - - - - 116

15½

Therefore on the whole, since the liquids and the urine were accurately measured, from the third day after the commencement of the treatment, the quantity of liquids drank has exceeded the urine made considerably. Though the urine has, through the progress of the cure, been less than the quantity of liquids taken, yet as the measurement had only commenced after such an actual change had been induced in the disease, when the quantity of urine had fallen from 10 to 2½ pints in the day, it may still be supposed that the urine exceeded the drink, and that probably there was an increase of absorption by the surface previous to the change produced in the condition of the stomach by the treatment; however,

ever, any skin or lung affection can only be admitted as depending on sympathetic affection with the stomach, and corresponding with the changes it undergoes.

On the 26th, Our patient left us, and returned home.

On the 6th March, Had a bowel complaint from eating beet root; and it appears he also had one on the 27th February, from eating something improper on the day preceding.

On the 9th, He had the sanction of a Physician to eat what he pleased, and drink wine. The disease was reproduced.

On the 14th, Some of the urine was evaporated, and it yielded a saccharine extract.

By Dr. TROTTER's letter of the 3d April, it appears that a return to our plan produced again its proper effect on the disease.

By a letter from another person, of the 7th May, the disease was again reproduced by a deviation from the plan of cure.

Our patient died on the 18th August, 1797; and a remarkable fact is recapitulated, that three weeks before this fatal termination, he had lost his appetite, the urine became apparently natural, and this even although he was continuing the use of wine and sweet cakes, &c.

On the whole, though our hopes of effecting a cure have been unfortunately frustrated in this case,

case, yet it has served to confirm the principles of the nature and treatment of the Diabetes Mellitus which we have advanced.

General and comparative Inferences resulting from both Cases.

1st. That the Diabetes Mellitus is a disease of the stomach, &c. proceeding from some morbid change in the natural powers of digestion and assimilation.

2d. That the kidneys, and other parts of the system, as the head and skin, are affected secondarily and generally by sympathy, as well as by a peculiar stimulus.

3d. That the stomach affection consists in an increased action and secretion, with vitiation of the gastric fluid, and probably of too active a state of the lacteal absorbents.

4th. That the cure of the disease is accomplished by regimen and medicines preventing the formation of sugar, and diminishing the increased action of the stomach.

5th. That confinement, an entire abstinence from every species of vegetable matter, a diet solely of animal food, with emetics, hepatised ammonia, and narcotics, comprehend the principal means to be employed.

6th.

6th. That the success of the treatment in a great measure establishes the five preceding inferences.

7th. That the saccharine matter of the disease is formed in the stomach, and chiefly from vegetable matter, as has been shewn by the immediate effects produced by the abstinence from vegetable matter, and the use of animal food solely.

8th. That acescency is predominant in diabetic stomachs, which continues even some time after the entire abstinence from vegetable matter, and after the formation of sugar; and that while such acescency remains, the disposition to the disease may be supposed to continue.

9th. That the saccharine matter may be removed in three days, and by avoiding vegetable matter, will not be again reproduced; but we are not yet able to state accurately when the disease, and the disposition to it, can be finally removed. Such knowledge may be, however, acquired in other cases, where the patients adhere correctly to rules.

10th. That there are two circumstances to be considered in this disease, which we may separate in the progress of the treatment; as it has been shewn, that though the formation of sugar was prevented, yet the increased action of the stomach remained; and maintained the defect of assimilation, which prevented nutrition. Hence two objects

jects occur in the cure: for it is not yet determined whether the preventing the formation of sugar by an entire abstinence from vegetable matter, and the use of animal food with fats, if properly persevered in, might not ultimately comprehend the other, namely, the removal of the morbid action of the stomach.

11th. That the lungs and skin have no connection with the production of the disease.

12th. That the quantity of urine is probably in proportion to the quantity of liquids taken in, and has but little dependence on absorption of fluids from the surface of either the skin or lungs.

13th. That though the disease has been shewn to consist in an increased morbid action of the stomach, and probably too great a secretion, with vitiation of the gastric fluid, yet the peculiar or specific conditions of either, as forming the disease, is acknowledged to lie in obscurity, and must remain so until the physiology of healthful digestion is properly explained and established.

14th. That the first Case had only been of about seven or eight months duration when the treatment commenced; but the second had been upwards of three years continuance. The age of the one was 34, of the other 57; circumstances which constituted material differences, though they seemed not to create corresponding difficulties in the treatment, so far as the direct removal

removal of the complaint was concerned. They may, however, retard in the one instance the entire restoration of health. This cannot now be determined, as the second Case has ended fatally, probably by the plan of cure not being duly prosecuted.

15th. That in both Cases, deviations occurred in the management, and were respectively followed by reproductions of the disease, and though disadvantageous to the patients, have confirmed our views of its nature and treatment.

16th. That from both Cases we may warrant this general conclusion, **THAT THE DIABETES MELLITUS IS SO FAR UNDERSTOOD, AS TO BE SUCCESSFULLY CURED.**

Lastly, That in fatal cases of the disease, death is probably occasioned by mere exhaustion, previous to which the Diabetes disappears—at least such seemed to take place in our second Case.

CHAP. II.

Of what has been communicated to us on the
DIABETES MELLITUS.

SECT. I.

CASES and COMMUNICATIONS *since the Dispersion*
of our NOTES of CAPTAIN MEREDITH'S CASE,
and previous to the first Edition of the Work.

THIS part of our subject is extremely satisfactory; and of course we enter upon it with peculiar gratification.

We embrace this opportunity of acknowledging the obligations we are under to our respectable correspondents—and while we admit the honourable testimony most of them have conferred on us, it must be left to the medical world to appreciate the disinterested efforts they have manifested for the improvement of medical science.

From

From DR. DUNCAN, *Professor of the Institutes of*
Medicine in the UNIVERSITY *of* EDINBURGH.

Edinburgh, 13th Jan. 1797.

IN a case of Diabetes which I treated, about 20 years ago, I found that the use of fat meat had a surprising effect in alleviating the thirst, and diminishing the quantity of urine. But the effect was temporary only, and I have not found it to hold to the same extent with other patients. The hepatised ammonia will, I hope, attract the attention of medical practitioners, and obtain a fair trial.

From DR. FALCONER, *of Bath.*

Bath, 13th Jan. 1797.

I SAW, about six years ago, a case of Diabetes in a gentleman, who really got it by drinking a liquor compounded of treacle and essence of spruce, fermented with water and yeast, forming spruce beer, of which he drank largely, to reduce a corpulent habit. I tried with him to increase the perspiratory evacuation by Dover's powder, and the warm bath ; but did not succeed. Indeed he was not a very tractable patient. I would recommend this remedy, with perhaps an
 increased

increased quantity of ipecacuan, to your consideration ; as it might produce perspiration, and check the canine appetite. Astringents I have seen tried, but with no advantage. Might not the mephitic alkaline water, impregnated with sulphureous gas, be of service? Might not a sulphureous ointment to the skin, made with some rancid animal oil, be a probable remedy? And might not a solution of sulphur in oil with some opiate, and mixed with starch or animal mucilage, be of service, thrown up as a clyster?

*From DR. BAILLIE, Lecturer on Anatomy and Surgery,
and Physician of St. George's Hospital, LONDON.*

March 2d, 1797.

MY paper on Diabetes was written two years ago, and read at that time to a society of which I am a member. It was determined by the society that it should be published, and it became from that moment their property. I have, therefore, no right to comply with your request. I examined not only the state of the kidneys, but of the stomach, the intestines, the glands of the mesentery, the liver, the spleen, and the pancreas; and I do not hesitate to mention to you generally, that I was induced to believe, from the morbid appearances in the kidneys, that the principal seat
of

of the disease was in them. This examination was made with a view to the different theories which have been formed about the cause of this disease, and I have added upon each of them a few observations. The paper will be published, as it was written two years ago, and nothing will be subjoined in consequence of what has been done lately. It will make me very happy, if a method of treating the Diabetes, which will commonly prove successful, shall be discovered; and my pleasure will not be diminished by thinking that the discovery has fallen into your hands.

From MR. ABERNETHY, Assistant Surgeon at St. Bartholomew's Hospital, and Lecturer on Anatomy and Surgery.

London, 12th April, 1797.

I TOOK no notes of the diabetic cases which were in St. Bartholomew's Hospital, as they did not belong to surgery. I was only desirous of knowing if the kidneys could form sugar. Once I had an opportunity of examining the blood, and was satisfied with knowing that the serum was not at all sweet. I recollect that it was *turbid*. When the patients took milk, oranges, and sugar, the quantity of the latter matter voided was greatly increased.

L

From

From DR. BEDDOES, of Bristol.

Bristol, 10th Jan. 1797.

I LAST night read your case of Diabetes with the most eager pleasure, and have ever since reflected on it with the utmost satisfaction. It is a pledge of the advance of medicine towards scientific principles. I am curious to know the progress of the case, and also of Mr. *Cruickshank's* ingenious researches. I had not been satisfied with any thing in Diabetes; but I think your experiments, and practice, have thrown a ray of light on this obscure subject.

I have been long looking out for diabetic patients, and your obliging communication will renew my diligence. One patient only I knew intimately—he has been thrice cured by the water here. I did not attend him, nor can I learn whether his urine was sweet. But it is certain he had thirst, emaciation, redness, voracious appetite, excessive discharge of urine (probably 20 pounds in the 24 hours). He has thrice visited this place in 12 years, and each time been recovered in a fortnight. No medical man attended him, and his country doctor is dead.

April 14th, 1797.

YOU ask my present opinion on consumption. Allow me generally to say, I have now
no

no chemical theory of any one disease. I never *held* any such opinion. In different ways (at lectures, and in publications), I started conjectures to be compared with facts; and now I think all those conjectures are shewn to be erroneous by facts. I used to think my hypothesis on scurvy very probable, and I was confirmed in this idea by Dr. Trotter. But I at present think we were both mistaken. Good, however, has arisen from these speculations, as they have brought forward observations, which otherwise apparently would never have been made; and some of these observations are useful in practice. When I publish my view of the medical treatment to be pursued in the pneumatic institution, I will unfold what I here say, and add my reasons:

From DR. CURRIE, of Liverpool.

Liverpool, Feb. 20th, 1797.

IN the course of my practice, I have met with a few cases of the Diabetes: chiefly in the Liverpool Infirmary. I have seen it stopped in its progress by opiates, cantharides, alum and bark: but after the saccharine impregnation of the urine, I never knew it cured. One case I took much pains with about four years ago: but my register, and notes, were purloined by some of the

pupils, and I could never recover them. I used the tepid bath in this case, with milk, and with broth; but never could discover that the patient gained any weight during immersion, though I weighed him with the utmost accuracy before and after. In a case where, in consequence of an obstruction of the pharynx, the patient died of hunger, after subsisting without swallowing upwards of thirty days, I had occasion to make the same remark. In the diabetic patient to which I allude, I weighed the ingesta, and the egesta (as far as they are capable of being weighed), and I found that the patient changed a seventh part of his whole substance every twenty-four hours!

You will be pleased to hear that we have at present an opportunity of putting your practice into trial, in a case of Diabetes now in our Hospital. It is under the care of my worthy colleague Dr. Gerard, to whom I have communicated your notes. From him or me you shall hear the issue.

I agree with you in the expectations you form of the benefit to medicine from the new chemistry. I may mention the application of the nitric acid to the cure of lues, communicated by Mr. Scott, of Bengal, to Sir Joseph Banks. I have proved this practice in various instances, and can assure you of its extraordinary success. I give one drachm of the acid daily, in a pint and a half, or two pints of water. The success of the nitric acid in this disease,

disease, has induced me to propose its trial in the yellow fever of the West Indies (in which mercury seems to be the only remedy on which any dependance is placed) and I have written to Sir Joseph Banks, to request his taking measures to bring this remedy under the notice of Government. In the mean time I have written to the Windward Islands, and Jamaica, on the subject.

18th March, 1797.

THE case which I mentioned to you of Diabetes, has been strictly attended to by my friend Dr. Gerard, who has noticed all the particulars you would wish, in a regular journal, which will be transmitted to you when the issue is known.

We wish much to have a small quantity sent by the coach of your hepatised ammonia, as we are doubtful whether we have succeeded in making it here, and we think the patient is in a state to be benefited by it.

There is no question about the anti-venereal effects of the nitrous acid. That which I have used has been nitrous, not nitric; for I had not the latter by me, and I found the former succeed. Whether it is equally efficacious with mercury in all cases, &c. must be left to more extensive experience.

From MR. MARCET, at present of EDINBURGH.

Mr. Marcet is a zealous student in physic, and a candidate for a medical degree; the subject of his Thesis, Diabetes. Our mutual friend Dr. Woollcombe, conveyed to him an account of Captain Meredith's Case previous to the dispersion of the notes on it. Mr. Marcet announced it at Edinburgh, and at this time there was one patient with the disease in the Infirmary, under the care of DR. HOPE, who adopted our treatment. An account of this case, by permission of DR. HOPE, Mr. Marcet has transmitted, as also an opinion of DR. RUTHERFORD'S with regard to the operation of the lungs in this disease. Mr. Marcet is entitled to our warmest thanks for the interest he has taken in the support of our ideas of the disease; an interest founded on his own anxiety for the promotion of medical science, as personally we are unacquainted. We hope he will permit us in this manner, to make our acknowledgments.

Edinburgh, 14th April, 1797.

DR. RUTHERFORD has repeatedly expressed his regret, in never having had an opportunity of examining a diabetic body after death. He is persuaded that the changes have not been looked for where they might have been found. He believes that

that the lacteal absorbents, and the lymphatics of the lungs, would be found enlarged, and perhaps the texture of the lungs altered. The supposition with regard to the lungs is founded on his notion, that the difference in the quantity of urine, beyond the fluids and even solids taken in during certain states of the Diabetes Mellitus, is to be accounted for, from the extraordinary production of water on the surface of this organ, which he supposes to be re-absorbed; and not from any absorption from the surface of the body by the skin.

4th May, 1797.

I SEND you an extract of the case of Walker, with Dr. Hope's permission, and you may do with it whatever you please. The effects of the animal diet on the quantity and quality of the urine are perfectly evident, though the case could not be carried to an absolute termination, from the impatience and instability of the patient. In Hospitals, where patients see three or four times in the day every person about them eating vegetables, a trial of an entire diet of animal food can hardly be expected.

ABSTRACT of a CASE of DIABETES MELLITUS, in
the ROYAL INFIRMARY, at EDINBURGH.

JAMES WALKER, a field-labourer, was admitted by DR. HOPE into the CLINICAL WARD, with a confirmed DIABETES, on the 1st November, 1796.

“ His appetite is voracious, and his thirst so urgent, as to make him desire from ten to sixteen quarts in twenty-four hours. His urine is præternaturally copious, and he has a frequent inclination to pass it. It is limpid, of a light green colour, and having a slightish sweet taste. He is much emaciated; and his feet and ankles swell towards evening. Pulse 96. Skin parched and rough. Body costive.

He recollects, on a frosty morning in December 1795, having slept some hours in an open cart. On the May following the above symptoms appeared, and have increased ever since. He has several times been the object of medical treatment; but without permanent relief.

2d.

Milk daily, and as much drink as he chooses.

3d.

Urine 22 pounds. Ingesta 20 pounds.

4th.

4th.

Urine 13 pounds. Ingesta 17 pounds. The urine becomes turbid on the addition of lime water; when evaporated it affords an extract like molasses, which is sweet to the taste. This matter mixed with lime, exhales the odour of ammonia.

From this day to the 29th December, he remained nearly in the same state, the quantity of urine fluctuating between 12 and 18 pounds in 24 hours. During this interval he took some ferum vitriolatum in the form of pills; used the cold shower bath, and took occasionally some emetics and laxatives;—the stomach being at times deranged, and the costiveness very obstinate. Under this treatment he seemed to get a little stronger, but without any important change in the general symptoms of the disease. It was agreed to try the effects of animal food, as lately given with success by Dr. Rollo at Woolwich, an account of which was transmitted by Dr. Woollcombe to Mr. Marcet.

December 29th.

DR. HOPE gave the following report. Ingesta 17 pounds; urine 13 pounds. Five pounds of this urine have afforded $5\frac{1}{2}$ ounces of a thick saccharine extract.

He has had for a month, an unpleasant sense of burning heat in the soles of his feet during the night.

He

He is directed to abstain from vegetable food in every shape.

To have two eggs for breakfast. Boiled meat and steaks alternately for dinner. Eggs, or cheese for supper. For drink eight pounds of weak beef tea, and two pounds of weak peppermint water.

30th.

Solid ingesta about two pounds; drink ten pounds; urine nine pounds.

Let him have two pounds of flesh meat for dinner; half a pound of cheese for supper; and three eggs for breakfast—drink as before.

31st.

Ingesta (drink, and food) ten pounds; urine five pounds, which exhales an unusually strong urinous smell. Had a partial sweat over the trunk and head in the night. Mouth moist; no sourness of stomach.

January 1st, 1797.

Solid ingesta as usual; drink nine pounds; urine eight pounds, more limpid than yesterday, and has a sharp acid odour. The breath has the same smell. The colour of the urine, however, is not changed, on addition of syrup of violets.

There is slight headach and sickness. The tongue appears much cleaner than usual. Has had a stool. Contin. diæta animalis.

2d.

Solid ingesta the same; drink eight pounds; urine six pounds. No sickness or headach; tongue clear; the burning heat of the feet as before. One loose stool. Contin.

3d.

Drink 10 pounds; urine $7\frac{1}{2}$ pounds, of a deeper yellow than formerly; tongue natural. Contin.

4th.

Drink ten pounds; urine seven pounds. Contin.

5th.

Drink nine pounds; urine $6\frac{1}{2}$ pounds, more yellow, with a peculiar (not urinous) odour. Contin.

6th.

No report, as last night he went out, returned to the ward drunk, so that his urine could not be measured.

7th.

Drink $7\frac{1}{2}$ pounds; urine 6 pounds, having the same peculiar smell.

8th.

Drink $7\frac{1}{2}$ pounds; urine 6 pounds; body coftive. Contin. diæta animalis. Sum: statim pil. rhœi. comp. ʒ 1 et iterum cras mane.

9th.

9th.

Drink six pounds; urine four pounds; a copious stool this morning; strength not changed since he began the animal food. Contin. et habeat aq. menth. piper. lbiv pro potu. minuatur quantitas decocti carnis ad lbiv.

10th.

Solid food as formerly; drink seven pounds; urine five pounds; no stool. Sum: statim pil. rhœi. comp. ʒ 1.

11th.

Drink six pounds; urine four pounds; three stools this morning. Contin. diæta animalis.

12th.

Drink six pounds; urine four pounds; two stools—he thinks his strength is somewhat impaired within these two or three days. Adeat eras mane balneum frigidum.

13th.

Drink seven pounds; urine five pounds; bore the bath well. Contin.

14th.

Drink eight pounds; urine six pounds. Contin.

15th.

Drink eight pounds; urine six pounds.

16th.

157

16th.

Solid food as before; drink eight pounds; urine six pounds, of a light straw colour, and with the peculiar smell it has had for some time.

The urine of the 14th being evaporated, afforded matter of considerable consistence, with a strong saline, but scarcely perceptible sweetish taste.

17th.

Drink eight pounds; urine six pounds; thinks he is weaker.

18th.

Drink eight pounds; urine $5\frac{1}{2}$ pounds. Contin.

19th and 20th.

Drink each day eight pounds; urine six pounds. Contin.

21st January.

Drink seven pounds; urine five pounds. He has left the Infirmary to-day, by his own desire, to return to the country."

4th May.

Dr. Hope told me a few days ago, that he had just then received a letter from Walker, who says that since he left the Infirmary he has become weaker; and there is some expectation of his returning soon to the Hospital to resume his treatment.

But

But it is doubtful whether when he was in the Clinical Ward he observed strictly the diet prescribed. At least he was accustomed to go about freely ; and the nurse told me repeatedly, that she suspected he did not entirely abstain from indulgencies of eating and drinking out of the house.

From DR. CLEGHORN, Lecturer in Chemistry, and one of the Physicians to the Infirmary at Glasgow.

Glasgow, May 1, 1797.

SOME months ago I was honoured with your excellent pamphlet on Diabetes. At that moment I had two diabetic patients in the Royal Infirmary of this place, and I began instantly to treat them on your plan. They are both cured ; and I have delayed so long to thank you for your politeness, in the hope that I might be able to inform you of this new success.

CASE I.

JOHN M'LEAN, a Porter, *Æt.* 38.

December 9th, 1796.

FOUR months ago had a fever, after which, while yet weak, he began to work hard. Soon afterwards

afterwards he observed his urine more abundant than usual, amounting daily to 24 pounds, or more.

Though his appetite be voracious, he becomes leaner from day to day, and is so weak that he cannot walk a few steps without panting. His mouth is parched, tongue red, thirst extreme, belly costive. Pulse 84.

A few days ago he had a slight cough, with pain in the right breast; but these complaints have abated.

The feelings about the stomach when he thinks himself hungry, differ from those he formerly had; they are more uneasy, and the uneasiness is less removed by taking food. He is often troubled with flatulence; and complains constantly of weakness or pain in the back and loins. Has used no medicines.

On examining the urine it was found limpid and very sweet. A pound of it yielded by evaporation more than an ounce of a thick brown extract, like treacle in appearance and taste.

December 10th.

He was ordered an ounce of castor oil, and the same quantity of compound tincture of senna. His loins were directed to be rubbed every evening and morning with anodyne balsam.

Equal parts of kino and rust of iron, formed into
pills

pills of five grains, with extract of chamomile, were to be given, two for a dose thrice a day.

His drink and urine were ordered to be measured daily, and the following reports, abridged from the Infirmary Register, shew the result.

11th and 12th.

One stool; urine 28 pounds; has drank about 14 pounds, besides the usual allowance of beer and broth.

13th.

Urine 27 pounds; drink 8 pounds; has had double allowance of food. Belly natural. To take 8 pills daily.

14th.

Feels himself a little easier and stronger. To drink a pint of alum whey daily at different times. To have the oil and tincture of senna when costive.

In this course he persevered till the 17th of January, 1797. The quantity of his urine diminished daily. On the 16th December it amounted only to 20 pounds; next day to 18; next to 15; next to 13; but on the 20th it rose to 16 pounds, without any cause that could be pointed out, unless the increase proceeded from costiveness. Next day it fell again to 13; on the 24th it rose to 15: after which it varied from 13 to $7\frac{1}{2}$ pounds. This was the quantity voided on the 17th January. It never fell below $7\frac{1}{2}$; most commonly it was between

tween 8 and 10 pounds. Meantime the patient considered himself as cured. He slept comfortably, sometimes not rising during the night, never oftener than once. The feelings about his stomach were more agreeable; his countenance looked less ghastly, and he felt his strength returning apace. On examining his urine, however, I had the mortification to find it nearly as sweet as ever. I considered the cure therefore as very incomplete, and I expected that the urine would soon begin to increase, as it had uniformly done in every case that I have hitherto seen, and I have seen a considerable number.

While under this painful apprehension I received Dr. Rollo's pamphlet, which seemed to me to contain a more distinct theory, and a more reasonable practice, than I had ever met with before.

As I could not immediately procure the hepatised ammonia, I ordered him to use for drink four pounds of water, containing a drachm of *lixiva sulphurata*. The alum whey to be continued.

January 18th.

Urine 8 pounds, with very little sweetness. Thirst increased, as he thinks, by the solution. The solution was omitted. Four drops of hepatised ammonia were added to a pound of water. Of this he was directed to use from 2 to 6 pounds daily

M

(for

(for the sake of brevity I shall afterwards call this the ammoniated water).

19th.

Has taken about 4 drops of the amm. hep. Remarkably sleepy. Urine 7 pounds.

Omit the alum whey; continue the ammoniated water.

20th.

Urine 8 pounds, sweet. Has used vegetables and milk freely. Took 3 pounds of the ammoniated water.

The necessity of abstaining from vegetables was explained, and enforced, and he was ordered to continue the water.

21st and 22d.

He took only 2 pounds of the ammoniated water. Urine 8 pounds.

Two drops were added, making 6 to each pound of water.

23d.

Urine about 7 pounds, less saccharine; has drank 4 pounds of the water.

From this date to the 30th, the urine was daily 7 or 8 pounds, and it was less sweet, though still perceptibly so. On the 30th, 7 drops were mixed with each pound of water, and given as formerly.

From

From the 1st February the patient came under the care of Dr. Richard Millar, who resolved to go on with the same experiment. On the 3^d the urine fell to $6\frac{1}{2}$, but was still sweet.

February 6th.

Ammoniated water 4 pounds; urine 7 pounds, still sweetish.

Besides the medicines, he was desired to drink a pound of lime water daily.

7th.

Ammoniated water 2 pounds; lime water 1 pound; a very good night; no thirst; urine $5\frac{1}{2}$ pounds, sweet.

8th.

Ammoniated water 3 pounds; no lime water; urine 6 pounds, sweet. Griping and tenesmus. The oil to be repeated.

9th.

Urine 7 pounds, still sweet; ammoniated water 3 pounds; no headach; but there is a little pain in the belly.

10th.

Ammoniated water 3 pounds; urine nearly 7 pounds, not so sweet.

11th.
Ammoniated water 2 pounds; lime water 1 pound; urine $5\frac{1}{2}$ pounds, less sweet.

12th.
Ammoniated water 2 pounds; no lime water; urine 6 pounds.

13th.
Ammoniated water 2 pounds; urine 7 pounds, still sweet.

14th.
Ammoniated water 2 pounds; lime water 1 pound; urine above 6 pounds, not so sweet.

15th.
Ammoniated water 3 pounds; urine $6\frac{1}{2}$ pounds, less sweet. Eight drops of the hepatised ammonia to each pound of water.

16th.
Ammoniated water 3 pounds; no perceptible effect from the additional drop; urine about 6 pounds, still sweet.

17th, 18th and 19th.
Ammoniated water 3 pounds; urine daily $5\frac{1}{2}$ or 6 pounds, less sweet.

He was directed to take 5 drops among a little water

water every second hour, and to swallow them immediately after mixture.

From the 19th to the 23d, the urine was from 5 to 6 pounds, much less sweet.

24th.

Several loose stools of a natural smell, which were checked by a grain of opium in the morning; urine about 3 pounds. The medicine was omitted for this day, and the opium ordered to be repeated, if necessary.

25th.

Looseness returned, with violent griping, and was relieved by a grain of opium and by fomenting the belly. Slept well; urine 3 pounds, of a natural smell, and hardly sweet.

The ammonia hepatifata and lime water were repeated; the opium omitted.

26th.

Purging returned. Took a grain of opium at 12 o'clock last night, since which he has had 2 loose stools. Urine $3\frac{1}{2}$ pounds, natural. Omit the medicines, repeat the opium, if necessary.

27th and 28th.

Urine 4 pounds, nearly natural. Medicines to be repeated.

March 1st—3d.

Urine 5 or $5\frac{1}{2}$ pounds, nearly natural.

4th.

Urine 5 pounds, not so natural.

The ammonia hepatisata never produced head-ach; it excited merely a sense of heat for a few minutes in the region of the stomach extending to the right side. Desired to take 50 drops in the day.

5th and 6th.

Urine $5\frac{1}{2}$ pounds, not so natural.

7th.

Urine 5 pounds, neither of a natural smell, nor is it very sweet. Directed to take 60 drops daily.

8th and 9th.

Took 66 drops. Urine 5 pounds, less natural.

10th.

This morning took 15 drops at once, with no other effect than a sense of heat in the stomach. Urine 6 pounds, less natural in taste and smell.

Finding himself strong enough, he asked leave to go home, (to the suburbs of Glasgow) to manage some business which required his presence. He promised to abstain from vegetables, to take his drops, and to return if he became worse. I have
seen

seen him several times at work, and this day, being the 10th of May, I received from his own mouth the following account.

In 24 hours his urine is about 5 pounds. He tastes it very often, and it has never been sweet, but after getting little animal food for days together (which has happened more than once) it has sometimes been of a sour smell. Formerly he could carry on a wheelbarrow three hundred weight; at present he carries one hundred weight, and he can walk as well as ever. Two days ago he went express to Paisley, received an answer to the letter he carried, and returned to Glasgow in three hours and a half (about $14\frac{1}{2}$ miles). Occasionally he has taken 60 drops a day of the hepatised ammonia, which he likes, because it gives him an agreeable feeling of warmth, and never produces any inconvenience. For two weeks, however, he has had none, since which his urine has not increased in quantity, has not been sweet, and when evaporated lately by himself, and by a neighbour of his, whose curiosity he has excited, it yielded no sugar. The residuum could not be distinguished from that of an equal quantity of healthful urine, evaporated at the same time with great care and sagacity.

The only kind of animal food that he can procure in sufficient quantity is blood, which he mixes with fat and a little meal. Even this

homely fare he finds it difficult at present to procure regularly.

He was always lean, and is now rather more so than before his fever; but though he works very hard, he thinks himself stronger, and more fleshy, than when he left the Infirmary. He sleeps well; is regular in his belly, and free from every complaint, except occasional pains about the muscles of his breast and arms, arising obviously from the intense colds to which he has been very much exposed, as he plies near the river from morning to night. He is the father of several children, but since he has been seized with Diabetes—Coitus nullus. Erigitum nunquam: ne quidem semel rigescit.

About a month before he left the Infirmary, the other patient gave the same account of himself.

CASE II.

JOHN ROGER, *Æt.* 40, a *Shoemaker*.

January 10th, 1797.

FOR two months his urine has been profuse, amounting daily to 20 pounds or more. It is limpid and sweet, yielding by evaporation an ounce of thick sweet matter, like treacle, from every pound.

He is thin and weak; habitually thirsty; for
some

some days past has felt a pain between his shoulders, and for a week his legs have been œdematous. Appetite keen ; pulse and belly natural.

Knows nothing to which he can attribute his complaint. Has used bitters, and other medicines, without material benefit.

The astringent pills, and alum whey, were ordered for him, as for M^cLean.

12th.

Urine 36 pounds.

13th.

Urine 30 pounds.

14th.

Urine 23 pounds.

15th.

Urine 20½ pounds.

16th.

Urine 21½ pounds ; thirst excessive ; sleeps ill ; pulse full and hard.

The medicines were omitted. He was directed to drink a solution of lixiva fulphurata, one drachm to four pounds of water, and to use animal food.

He got castor oil, with tincture of senna, and at
bed-

bed-time had a draught, with 25 drops laudanum, and 30 of antimonial wine.

17th.

Rested well; urine 21 pounds; likes the drink.

18th.

Three stools; was sick, and vomited after supper; thirsty; urine 9 pounds, still sweet.

The solution was omitted, and the draught repeated.

19th.

Urine 14 pounds, very sweet. No stool. The draught was omitted, and 4 drops of the hepatised ammonia were given in a pound of water, as for M'Lean.

Of this ammoniated water, he drank daily from 2 to 5 pounds, using castor oil when necessary.

On the 24th his urine amounted to 8 pounds only, and was almost natural. Next day it was 14 pounds, and varied from 10 to 13 pounds, being sometimes more, sometimes less sweet, till January 31st, when my attendance at the Hospital having ceased, Dr. Millar took charge of this patient also. The following reports will shew the effects of the medicine, &c.

February 5th.

Urine 13 pounds, still sweetish; 2 pounds of ammoniated water. His headach and giddiness,
more

more or less severe, according to the quantity of ammoniated water that he drinks.

6th.

Ammoniated water 3 pounds; urine 14 pounds, still sweetish.

To drink a pound of lime water daily.

7th.

From the 22d to the 30th of January, each pound of water contained 5 drops of amm. hep. from the 30th of January to this day, each contained 6 drops.

Ammoniated water 2 pounds; urine 12 pounds, not so sweet; thirst abated by the lime water. To-day weak; appetite bad; skin warm; pulse natural; no stool since the 5th; to have the castor oil immediately.

8th.

Ammoniated water 3 pounds; urine $7\frac{1}{2}$ pounds, still sweet; head confused and uneasy.

In this state he continued until the 11th.

Ammoniated water $1\frac{1}{2}$ pound; lime water 1 pound; urine $8\frac{1}{2}$ pounds, more like natural urine in taste, smell, and appearance.

12th.

Ammoniated water 2 pounds; no lime water; urine 9 pounds, sweeter. For some days has been
squeamish,

squeamish, with little appetite, and a tendency to diarrhoea. Together with the usual medicines he was ordered to take thrice a day, two ounces of infusion of quassia, and a little tincture of rhubarb.

13th.

Ammoniated water 2 pounds; urine 9 pounds; appetite better.

26th.

Squeamish in the morning. Ammoniated water $3\frac{1}{2}$ pounds; urine $9\frac{1}{2}$ pounds, not so sweet. To have 8 drops of the hepatised ammonia to each pound of water.

17th, 18th and 19th.

Took daily of the ammoniated water from 2 to 3 pounds; urine 8 or 9 pounds, less sweet. Five drops of the hepatised ammonia, mixed with a little water, were ordered every two hours. The urine never fell below 8 pounds a-day; the sweetness diminished, but never ceased entirely.

March 5th.

He was ordered to take 50 drops of the hepatised ammonia daily. Urine $8\frac{1}{2}$ pounds.

The next morning he was seized with griping and purging. The medicine was omitted, and he was directed to use an astringent with opium, if
the

the purging or pain should become excessive : the astringent, however, was not needed.

13th.

Ammonia hepatifata 60 drops; drink 4 pounds; urine 9 pounds.

In order to ascertain the effect of volatile alkali without hepatic gas, the former medicine was omitted, and 20 drops of the pure water of ammonia were ordered to be taken thrice a day in beef tea. It was gradually increased to 120 drops. The urine continued from 9 to 9½ pounds, never entirely free from sugar, but more so than formerly.

25th.

Drink 2½ pounds. Aq. ammon. puræ gt. 120. Frequent vomiting. Urine rather increased, very sweet, and of a morbid smell.

The medicines were omitted, and he was directed to take half a grain of opium immediately; and the same quantity when the sickness or vomiting returned, until he had taken 2 grains.

26th.

The sickness abated without opium; urine 9½ pounds; medicines still omitted. For some days he used no medicine, except a quantity of lime water for drink; and there was no change in the urine.

30th.

30th.

Drink $3\frac{1}{2}$ pounds; urine 8 pounds; a feeling of weakness, and lassitude in the region of the kidneys—a small blister was applied over each kidney.

31st.

Sweated much during the night. Says he is less troubled than usual with *enuresis*. Pulse about 115. Drink 4 pounds; urine 9 pounds, of an unnatural smell, but not sweet.

April 3d.

Issues by means of caustic were ordered to be formed over each kidney. He was directed to drink sparingly, chiefly lime water, and his diet was regulated with more care. For it was found, that all along he had used a great proportion of vegetables for food, and had been guilty of irregularity also in drinking. He was ordered to get no vegetables; however, he was allowed one roll a day; the rest of his diet consisted of soup, blood-puddings, and butcher's meat roasted, or boiled, as he chose.

5th.

Drink 5 pounds (3 of which lime water); urine $8\frac{1}{2}$ pounds, free from sugar, of a bitterish taste, but unnatural smell. Had violent headach last night (from the issues he thinks) but is easy to-day.

7th.

7th.

This morning had nausea, heart-burn, and head-ach, which are now gone. Drink 4 pounds ($1\frac{1}{2}$ of which was lime water); urine hardly 8 pounds, almost natural. He was desired to take a scruple of ipecacuan, and after the vomiting a grain of opium.

8th.

What he vomited yesterday had a sweet taste; belly bound; was giddy this morning; pulse 100; drink about 8 pounds (no lime water); urine 6 pounds, of more natural smell, but less salt than yesterday. To have immediately 15 grains of jalap, with 8 of cinnamon.

9th and 10th.

The jalap did not move him, and he had only one costive stool after an ounce of castor oil. Thirst much abated; urine from 5 to 6 pounds a day, nearly natural. Ordered an ounce of castor oil, and one of tincture of jalap; one half to be taken instantly, and the other after three hours.

11th.

Three stools. Feels himself stronger, and in better spirits. Pulse 80. Drink 3 pounds (no lime water); urine $6\frac{1}{2}$ pounds, nearly natural.

12th,

12th, 13th and 14th.

Thirst abated ; urine from 6 to 7 pounds, of natural taste and smell, and when evaporated yielded no sugar. Thus he continued free from thirst, though his mouth was parched and dry during the night ; he gained strength and flesh ; his urine never exceeded $6\frac{1}{2}$ pounds, and seemed perfectly natural till the

30th,

When it again became sweet ; having been strictly questioned, he confessed that he drank a quantity of small beer yesterday afternoon, and we have found that he has committed several other irregularities.

May 1st.

Urine again natural. This day he left the Infirmary, having promised to persist in the use of animal food, and to return if he should relapse. He is gone to Irvine, about 30 miles distant, and nothing has been heard from him since.

These patients were examined daily in the Royal Infirmary of Glasgow, and the reports were dictated before the Students, of whom many examined very scrupulously the changes of the urine, and all other circumstances respecting a disease to which their attention was strongly attracted both by the *novelty* of the treatment, and their having
seen

seen a case which ended fatally not long ago. In copying the reports I have omitted every circumstance that seemed unessential, and I have abridged the language so far as I thought consistent with perspicuity. I have dropped the Latin form of prescribing, though it gave me some trouble to express the prescriptions shortly in English (and many of them look awkward enough) because I was desirous of making the cases intelligible to those who do not practise physic, as I hope this very interesting inquiry will soon excite the attention of the public.

After stripping the cases of every necessary detail, I shall not load them with many additional remarks. *They seem to me very strong confirmations of your doctrine*, in every point, except what regards the hepatised ammonia. At first perhaps it was not properly prepared, after a little while, however, it was; and it seemed to have very little power over the urine. In one patient (but he was querulous and fanciful) it seemed to affect the head; in the other, it seemed to act like common volatile alkali, by producing an agreeable sensation of warmth in the stomach. Our patients, indeed, were in many respects different from yours; and it is very common to find the operation of medicines strangely modified by the varying habits and susceptibilities of patients.

The alum whey (formed by boiling a drachm of alum in a pint of milk) seemed to produce considerable

siderable effect, at least in reducing the quantity of urine. The castor oil appears to be the most useful laxative; but no medicine was of any permanent advantage without the *aid of animal food*. This is more powerful than any medicine, and very probably this alone, properly managed, may be found sufficient for the cure in many cases.

Whether the cure in our two patients be complete or not, is a question which I shall not labour to decide by argument. For my own part I think they are cured, though they may never perhaps be so strong as they were, and both may probably relapse; because, being poor, they are exposed to the double risk of severe labour, and improper food. Besides, on many other occasions, a tendency to relapse is not considered as a proof of imperfect cure. Is an intermittent not cured, because one who has had it this spring, will be found very subject to it next season, if he shall be exposed to the cause which commonly produces it?

Glasgow, May 22, 1797.

I COULD not see the gentleman who prepared our hepatised ammonia till this day, and from his account I imagine your conjecture is well founded. Ours was very different from your preparation. Some of the hepatic gas was procured by pouring marine acid on sulphur and iron filings merely rubbed together: but the greater
part

part was obtained from the iron and sulphur melted together in a crucible, and then powdered. In both cases, the smell and taste of the volatile alkali continued very strong. I am satisfied, therefore, that no inference respecting the real effect or activity of this preparation can be drawn from our experiments.

The diabetic patient who died, was not opened. She died at home, and was buried very soon, and secretly, in order to prevent all application.

Since the cases were transmitted to you, *John Roger* has returned from *Irvine*. He continues well, but has a greater appetite than usual. His urine is salt, and in a natural quantity.

*From *****.*

MR. ASTLEY COOPER, at ST. THOMAS'S HOSPITAL, having mentioned in one of his anatomical demonstrations, our views of the nature of diabetic disease, a young gentleman present, who had a relation in the country with the complaint, expressed a wish to be more particularly informed, and was referred to us. He gave a concise account of the Patient; and it was suggested, as the Patient was so far advanced in life, an immediate application of our treatment to its whole extent might not be advisable; the gradual adoption of it was therefore recommended. As the

N 2

Patient,

Patient, however, had been a Physician of long practice, though now retired, and being immediately under the care of a respectable Physician in extensive business, we requested that our opinion in general might be conveyed along with the printed notes of Captain Meredith's Case. This was on the 19th March, 1797. The following account, written by the Patient himself, we received on the 18th May, being only a period of two months.

Guy's Hospital, 18th May, 1797.

SIR,

THE inclosed account is drawn up by my friend the patient himself. I think it incumbent on me to return my best thanks for your kind and ready advice, from which the patient has derived so much advantage.

I am, Sir,

yours, &c.

G. B.

DR. ROLLO may make what use he pleases of the under described case, provided he does not insert the name of the Patient or that of his Physician.

A gentleman far advanced in life, being now in his 77th year, and during the greatest part of that time in pretty uniform good health, except some attacks

attacks of erysipelas about mid-age, and latterly a chronic rheumatism in the loins, occasioning more of stiffness than pain. He has been accustomed to live after the common mode of sober persons, or if prone to any excess, it was chiefly in the use of sugar. He began about two years ago to feel a great increase of general debility, to which was soon adjoined an unusual frequency of discharge by the bladder. The urine exceeded the quantity taken in by one third, and it was voided with a forcing kind of pain, both at the commencement and close of the emission; made mostly in small quantities at a time. These calls became soon so multiplied in the night as greatly to disturb natural rest; and the mouth and fauces grew so dry as to oblige the patient to keep small pebbles rolling continually in the mouth during the day time. The inspissation of the saliva was such as to make it difficult to spit it out, unless previously diluted. The hands shook to such a degree that rendered it dangerous to shave, and hardly possible to write legibly, while the lower limbs felt as if scarce able to support the trunk of the body; the feet and ankles swelled considerably; the thirst was intense, but there was very little shew of fever by the pulse.

Under these circumstances the opinion of an eminent Physician in the neighbourhood was asked, who recommended lime water, earth of alum, afterwards pills of catechu, alum, and a small por-

tion of vitriolated zinc. By these remedies the forcing at the neck of the bladder was a good deal relieved; but the very distressing dryness of the mouth and fauces still continued, and was by nothing so much solaced, as by moistening with milk and water. The urine remained, as it had always been, well coloured, frothy upon first emission, and favouring strongly of that sweetness, to scent and taste, characteristic of diabetic urine.

Upon receiving from a young friend, a pupil at the Hospitals in Southwark, Dr. Rollo's notes on a case of this sort, the Patient and his Physician agreed to avail themselves of this plan of treatment, with some accommodation to the circumstances of the individual, and they have found reason to be satisfied with the adoption of it.

Vegetable articles of diet had been long discarded; and the use of pure sugar, since the excellent hints in that communication, had been entirely laid aside. Rancid fats and putrescent flesh could not be admitted even in idea, without inducing nausea: instead of these were employed fresh mutton, animal gluten, mucilage, &c. At breakfast he takes milk, with some cocoa, or chocolate; for supper, calves' feet jelly with milk, and sometimes an addition of sweet almonds. A moderate allowance of wine has been continued, as indispensibly necessary for support; but the least acid foreign wines have been used, and a gradual
reduction

reduction is making in this hitherto necessary, indulgence. Of medicines, the saturated solution of soda, and Schweppe's soda water, have been only employed : from the last there is every reason to believe a share of the amendment may be attributed. *See Dr. Falconer's letter to us, where he points out the mephitic alkaline water as likely to be of advantage in this disease.*

The urine does not now considerably exceed the liquid taken in. In the day time it is voided frequently, but without pain ; the night calls are diminished to one, very rarely two occur. Its colour is good, and its sweetness can hardly be said to be perceptible. The excessive dryness of the mouth and fauces, that depraved the taste for any aliment, particularly bread, and in consequence impaired the appetite, is nearly removed. The feet and ankles swell a little at times, which may be in some measure owing to the large proportion of the *νυχθημερον*, during which, though the days are so long, yet the patient is unrecumbent sixteen or seventeen hours at least.

With this hasty sketch you will please present my best compliments and thanks to Dr. Rollo.

From DR. GERARD, Liverpool.

The following case is that mentioned in Dr. Currie's letter to us, and we communicate it with the greatest
 N 4 *pleasure*

pleasure to the public, as being drawn up with the utmost accuracy, and containing details of procedure of the utmost importance towards perfecting our views of the nature and treatment of the disease, as well as of confirming them.

THE CASE.

JOHN CLARKE, *aged* 38, was received into the LIVERPOOL INFIRMARY, under DIABETES, on the 9th February, 1797.

He was a soldier in Lord Darlington's Light Horse when they were reduced in February, 1796.

At that time he was in good health; thinks he might then have weighed about 140 pounds in his clothes; he is 5 feet 7½ inches in height; has dark hair and grey eyes. He always enjoyed good health, but was subject to pyrosis, and accustomed to perspire much. Happening to reside near the sea-coast, he has from a boy been used to bathe frequently during the summer months, not for any indisposition, but merely for gratification; sometimes he went into the water twice the same day, and staid in it 10 or 15 minutes; being always of a costive habit, he also drank of the water occasionally. He discontinued the practice of bathing, however, whilst the weather still continued warm, as early, he thinks, as the beginning of August; his habitual perspiration lessened afterwards

terwards by degrees, and he continued in good health till about the end of November, 1796, when the perspiration entirely ceased, and the cuticle became unnaturally dry, harsh, and rough, and is now to all appearance dead, and incapable either of perspiration or absorption, or any kind of transmissiion. About this time some headach also came on, and the bowels became in general more costive, though he was sometimes troubled with a lax for a few days.

With the preceding symptoms he was afflicted with a most distressing thirst, which was not to be satisfied. His appetite was increased, and yet he lost flesh daily, and grew weaker very fast, particularly in the thighs and small of the back, attended with pain in the region of the kidneys. He also observed, that he made much more urine than usual, and that the quantity increased from day to day.

It should be remarked, that having no other means of getting here, he was under the necessity of walking from five to eight miles each day, for three successive days, before he reached Liverpool; but this was a whole day's work, and a great fatigue to him.

Considering this to be a case, that from all former experience might almost be deemed incurable, I wished to consult my *Colleagues*, Dr. BRANDRETH and Dr. CURRIE; therefore I only
ordered

ordered him a dose of castor oil, to remove the costive state of the body.

Those gentlemen saw him with me on the 11th *February*. At this time *Dr. Currie* had just received a publication from *Dr. Rollo, Surgeon General to the Royal Artillery, at Woolwich*, of a case of Diabetes that he had treated with success; he had not read it; but he understood that much was attributed to animal diet.

On this authority our patient was ordered to live chiefly on flesh and milk; he was also directed to use the warm bath, and with a view of ascertaining whether the generally received opinion that absorption takes place in this disease be true, he was desired to be weighed naked, both before he went into it, and upon coming out (*Dr. Currie* having observed in a case of a different nature, that no absorption took place in the warm bath); the pulse to be counted; and the heat of the body ascertained by placing a thermometer under the tongue, and to note the whole down.

February 12th.

He went into the bath for the first time, when
The pulse was, before

bathing,	75,	after it,	85.
Heat of the body	91,	———	95.
Weight of the body	112lb. 4oz.	—	112lb. 6oz.

He

He continued in the bath 12 minutes, which having been as high as 116 degrees of Fahr. may have acted as a stimulus sufficient both to quicken the pulse and increase the heat. The 2 ounces he appears to have gained after having bathed, is not to be attributed to absorption, but to water remaining amongst the hair, and adhering to the body; for he had unintentionally been over the head, and the body had not been wiped dry.

15th.

He used the bath a second time, the temperature was 110, below which he felt it cool.

The pulse, before

bathing, was	90,	after it,	115.
Heat	98,	———	99.
Weight	108lb. 14½oz. — 108lb. 14½oz.		

He remained in the bath 12 minutes, and was rather faint.

The quantity of urine daily has not been before ascertained; but in the last 24 hours it amounted to 17 pints, which yielded, on evaporation, two and a half pounds of a saccharine extract, resembling treacle or molasses, in colour and consistence, having a very sweet taste, though somewhat saltish, but wanting the urinous smell. During the same time he took two pounds and a half of animal food, and twelve pounds of liquids, including milk, beer,

beer, and water. The directions for his living on animal food having been misunderstood, he has hitherto had only one meal of flesh daily, and with it a portion of potatoes and bread.

16th.

The urine was reduced to 15 lb. 12 oz. and on evaporation it yielded a less proportion of the saccharine extract, viz. 1 lb. 5 oz. it was besides of a paler colour, and more like thin honey; after standing till the next day, a kind of crystallization, or granulation, appeared, adhering to some parts of the basin it had been put into, forming prominent points; this increased so fast, that in 48 hours after, it became one solid mass, of the consistence of beef fat that has been melted and become cold again, and in colour much like suet, feeling unctuous, but dissolving entirely in cold water, and in a moderate heat melting again, and forming a transparent substance very like barley sugar, but somewhat browner; it is of a mixed smell, betwixt urinous and saccharine, but chiefly of the latter.

17th.

The urine was only 14 lb. 8 oz.

18th.

He used the bath again, in which he remained 12 minutes.

The

The pulse was, before

bathing,	90,	after it,	95.
Heat	95,	————	100.
Weight	105lb. 8oz.	—	105lb. 8oz.

I saw him this day about an hour after he had been in the bath, when his face appeared moist and oily as from perspiration, and he said he had felt a general moisture or softness like perspiration for about 10 minutes, and the pain in his back was gone.

19th.

He made 15 lb. of urine.

20th.

Having read Dr. Rollo's publication, he was ordered this day to live entirely on animal food and broth, without either bread, beer, or any vegetable matter, and to persist in that plan without taking any medicine whatever; for as diet appeared to have had a principal share of the success experienced in Dr. Rollo's case, we wished to try whether that plan only was capable of effecting a cure.

21st.

He went again into the bath, the temperature of which was 105, and he remained in it 15 minutes.

The

The pulse was, before		
bathing,	73,	after it, 74.
Heat	98,	——— 98.
Weight	107lb. 4oz. —	106lb. 8oz.

The circumstance of his being lighter when he came out of the bath seemed extraordinary, and suggested the probability of his having made water whilst he was in it, which upon enquiry was found to be the case, and accounts for the difference as satisfactorily as on the 12th; and it is worthy of remark, that no observable difference has taken place in the weight of the body, before and after bathing, excepting in those two instances.

He took beef and broth; he made 8 pounds 4 ounces of urine in the last 24 hours; his thirst is not so excessive.

22d.

Urine only 6 pounds 4 ounces; it had a more urinous smell, and deposited a light coloured sediment; on evaporation it yielded 9 ounces of extract, of about the same consistence as the former, but not so sweet: some of the dead cuticle begins to come off: he has gained 1 pound 12 ounces in weight since the 18th.

23d.

The urine voided weighed 9 pounds 8 ounces. The pain in the back has entirely left him, and while

while he lies in bed he feels himself almost well; yet he is unable to walk about much, or even to sit up very long; his thirst is also much abated, for though he could drink with pleasure, he has not the same avidity; he complains for the first time of some sickness, but it appears to be the mere effect of his plan of diet, which he begins to be tired of. He was allowed a little beer.

24th.

Urine 8 pounds, which had still a more urinous smell, and a copious white coloured sediment, amongst which I plainly discovered distinct red grains, that were evidently gritty to the feel.

He used the bath, the temperature of which was 100, and he remained in 14 minutes.

The pulse, before

bathing, was	88,	after it,	88.
Heat	98½,	———	98.
Weight	109lb. 2½oz. — 109lb. 2½oz.		

He continues to gain weight. He complained of sickness through the day, with an aversion to his food. He took two pounds of beef, and 6 pounds of broth.

25th.

The dead cuticle is peeling off, and he is obviously improving in every respect, and gaining weight.

In

In future it is to be understood that the temperature of the bath will be 100, and that the patient will remain in it 10 minutes.

Pulse to-day, before

bathing, was	90,	after it,	90.
Heat	98,	————	98.
Weight	111lb. 4½oz.—	the same.	
Ditto yesterday	109	2½.	

Difference gained 2 2.

He continues the diet of animal food, with the daily allowance of a pound of beer. He has had regular stools these three days past, which have been deeper coloured, more lax, and more feculent. The quantity of urine, 5 pounds 5¼ ounces.

26th.

The pulse, before

bathing, was	72,	after it,	76.
Heat	97,	————	98.
Weight	108lb. 8½oz.—	the same.	
Ditto yesterday	111	4½.	

Difference lost 2 12.

Urine 5 pounds 14 ounces.

He says his appetite has been worse for want of beer, which had been omitted by mistake. Complains of pain in the head and back, sickness and griping, and has had several loose stools.

27th.

27th.

The pulse, before			
bathing, was	80,	after it,	76.
Heat	98,	———	98.
Weight	114lb. 1oz. —		the same.
Ditto yesterday	108	8½.	
Difference gained	5	8½.	

The animal food is continued, with a pound of beer.

The pain in his head and back are abated ; but the sickness remains, also the griping and looseness ; the appetite, however, is rather better.

Urine 4 pounds 3½ ounces, it is almost of a natural smell, but has no sediment.

28th.

The pulse, before			
bathing, was	78,	after it,	80.
Heat	98,	———	98.
Weight	118lb. 4oz. —		the same.
Ditto yesterday	114	1.	
Difference gained	4	3.	

He took an emetic, which has relieved his sickness. Urine made, 3½ pounds, has a natural smell, and deposits some sediment. The dead cuticle is coming off very fast, and that underneath

neath seems soft and natural. He petitions for some bread.

March 1st.

The pulse, before

bathing, was	69,	after it,	70.
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Heat	98,	————	98.
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Weight	117lb.	————	the same.
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Ditto yesterday	118	4oz.	
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Difference lost	1	4.	
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Urine $6\frac{1}{2}$ pounds. The sickness is gone, but the gripings continue; he fancies he gets cold by bathing.

2^d.

The pulse, before

bathing, was	66,	after it,	70.
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Heat	$98\frac{1}{2}$	————	$98\frac{1}{2}$.
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Weight	118lb. 7oz.	—	the same.
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Ditto yesterday	117.		
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Difference gained	1	7.	
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Urine 6 pounds $5\frac{1}{2}$ ounces. The animal food, with the beer, has been persisted in.

I have hitherto thought the griping and looseness were accidental, but as they continue, they may perhaps be owing to the great change made in

in

in his diet; on that idea, therefore, I have allowed him half a pound of bread daily, and have ordered him 30 drops of laudanum at bed-time.

He feels himself considerably stronger, and can sit up much longer at a time. He has no extraordinary thirst; the urine has neither sediment nor smell.

3d.

The pulse, before bath-

ing, was	66,	after it,	68.
Heat	98,	———	98.
Weight	118lb. 3oz. —	the same.	
Ditto yesterday	118	7.	

Difference lost 4.

Urine 6 pounds 3 ounces.

Diet, animal food, with a pound of beer, and 8 ounces of bread.

The griping was relieved by laudanum; but it returned in the night, attended with several loose stools.

4th.

The pulse, before bath-

ing, was	66,	after it,	66.
Heat	98,	———	98.
Weight	116lb. 4oz. —	the same.	
Ditto yesterday	118	3.	

Difference lost 1 15.

O 2

Urine

Urine 6 pounds 5 ounces. The looseness and griping continue; the laudanum was accidentally omitted. The appetite is more craving.

5th.

The pulse, before bath-

ing, was	63,	after it,	66.
Heat	98,	————	98.
Weight	115lb. 12oz.—	the same.	
Ditto yesterday	116.	4.	
Difference lost	<hr/> 8.		

The griping is relieved, but he complains of headach; he is not so thirsty, nor is the appetite so keen as yesterday; the diet is continued. The urine 4 pounds 13 ounces, it deposits a light brown sediment, and is of an urinous smell.

6th.

The pulse, before bath-

ing, was	66,	after it,	66.
Heat	98,	————	98.
Weight	114lb. ———	the same.	
Ditto yesterday	115lb. 12oz.		
Difference lost	<hr/> 1 12.		

Urine 5 pounds 9 ounces. The thirst and appetite increase,

The

The griping and looseness do not abate by the admixture of vegetable matter, on which idea only the bread, as it may be remembered, was allowed. He loses weight daily. This reverse of the success we experienced in the beginning, would prompt me strongly to have recourse to the sulphurated kali, or hepatised ammonia; but the circumstance of his having gained so much advantage, and so rapidly, while he lived on animal food entirely, and the wish to try what that diet alone would effect (which should be remembered was the plan we set out upon), determines me to return to it again, especially as it may enable us to decide whether it is alone equal to the cure. I therefore ordered both the bread and beer to be discontinued; and to rely on the laudanum, absorbents, &c. to correct the diarrhœa. He was allowed milk in place of the beer.

7th.

The pulse, before bath-

ing, was	66,	after it,	68.
Heat	98,	———	98.
Weight	113lb. 12oz.		the same.
Ditto yesterday	114.		

Difference lost 4.

The old dead cuticle does not come off so rapidly as it did some time since. Appetite strong;

but the thirst is abated; the griping is relieved. The quantity of urine 2 pounds 10 ounces, it has no sediment; and although so much reduced in quantity, very little is mixed in his stools, as he makes all the water he can before he goes to stool.

8th.

The pulse, before bath-

ing, was	60,	after it,	60.
Heat	97,	———	97.
Weight	113lb. 14oz.		the same.
Ditto yesterday	113	12.	
Difference gained	<hr/> 2.		

Ordered the bath to be used every other day; but the body to be weighed daily.

He has little or no thirst; tongue very clean and moist; appetite satisfied; the griping returned about 7 o'clock in the evening, at which time he took 30 drops of laudanum, it was repeated at 9, and he took 30 drops more in the cretaceous mixture, in all 90 in the course of the night: notwithstanding which he had 9 or 10 stools.

Urine 2 pounds $3\frac{1}{2}$ ounces; it has little smell, tastes salt, and not at all sweet; it is rather higher coloured, but deposits no sediment. On being evaporated it produced 2 ounces of extract, which had a sweetish smell, but to the taste it was salt and bitterish.

9th.

9th.

Pulse	—	64.
Heat	—	98.
Weight	—	112lb. 8oz.
Ditto yesterday		113 14.
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Difference lost	1	6.

Urine 2 pounds 12½ ounces.

The griping returns at intervals, but has not been so violent; has been sick, and vomited a little; he continues the laudanum with the cretaceous mixture, and the diet of animal food.

10th.

The pulse was, before

bathing,	58,	after it,	58.
Heat	96,	————	97.
Weight	110lb. 12oz.		the same.
Ditto yesterday	112 8.		
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Difference lost	1	12.	

Urine 4 pounds 9 ounces; it has a more natural smell than any he has before made.

Notwithstanding the looseness continues, and he loses weight, he feels himself sensibly stronger; his appetite and thirst are moderate.

11th.

Pulse	—	65.
Heat	—	98.
Weight	—	108lb. 8oz.
Ditto yesterday	110	12.
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Difference lost	2	4.

Urine 5 pounds ; it has deposited no sediment lately. The griping still returns at intervals, but with less severity ; feels a little sickish.

12th.

The pulse was, before

bathing,	58,	after it,	60.
Heat	98,	————	98.
Weight	111lb. 6oz.	—	the same.
Ditto yesterday	108	8.	
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Difference gained	2	14.	

Urine 4 pounds 11 ounces.

The griping and sickness are abated ; in other respects as yesterday. He continues the diet.

13th.

Pulse	—	61.
Heat	—	97.
Weight	—	111lb.
Ditto yesterday	111	6oz.
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Difference lost		6.

Urine

Urine 5 pounds 7 ounces.

Continues much the same.

14th.

The pulse was, before

bathing, 80, after it, 80.

Heat 97, ——— 97.

Weight 112lb. 8oz. — the same.

Ditto yesterday 111.

Difference gained 1. 8.

Urine 5 pounds 2 ounces.

He is rather more thirsty ; his appetite is not so good, being fatiated with animal food ; he was allowed an onion to his meal.

15th.

Pulse — 80.

Heat — 97.

Weight — 112lb. 4oz.

Ditto yesterday 112 8.

Difference lost 4.

Urine 4 pounds 3 ounces.

He has had no broth these two days ; the griping is abated, but he complains of flatulency.

Three days urine, taken about the 20th of February, amounting to about 40 pints, had some yeast added to it. It fermented strongly for 14 or 15 days,

15 days, when it was distilled, and yielded 6 pints of spirits. It was then rectified, and the spirit obtained had some dry alkaline salt added to it; after digesting some time it was again rectified, and gave 9 ounces and 3 drachms, by measure, of alcohol, and 2 ounces and 3 drachms of a spirit about proof.

16th.

The pulse was, before

bathing,	70,	after it,	70.
Heat	97,	————	97.
Weight	112lb. 8oz.	—	the same.
Ditto yesterday	112	4.	

Difference gained 4.

Urine 4 pounds.

He has continued the onion, but thinks it occasions him to make water oftener, though not more in quantity; his thirst and appetite he thinks are keener; the griping is abated, but the flatulency is troublesome.

17th.

Pulse	—	88.
Heat	—	39.
Weight	—	113lb.
Ditto yesterday		112lb. 8oz.

Difference gained 8.

Urine 3 pounds 5 ounces.

He

He is still very uneasy from flatulency, but not troubled with griping ; thirst, appetite, and appearance of the urine, as they have been for some time.

He has had 2 drachms of æther, and 5 grains of ammonia, added to his draught.

18th.

The pulse was, before

bathing,	84,	after it,	84.
Heat	96,	————	96.
Weight	114lb. 3oz.	—	the same.
Ditto yesterday	113	3.	

Difference gained 1 3.

Urine 2 pounds 14 ounces ; it is somewhat sweetish.

The flatulency is relieved ; the thirst and appetite lessened ; the griping is quite gone.

19th.

Pulse	—	86.
Heat	—	97.
Weight	—	115lb.
Ditto yesterday	114	3oz.

Difference gained 13.

Urine 4 pounds 10 ounces.

He was hot after taking his draught, but did not sweat ; he feels weaker to-day, particularly in the

the small of his back; appetite and thirst are a little increased.

Being desirous of gratifying my patient with any change of diet that could be indulged in without impeding the cure, I ordered him to have a meal of fish, two or three times a week, meaning at the same time to ascertain whether that deviation from the plan of animal diet might be allowed with impunity.

20th.

The pulse was, before

bathing,	72,	after it,	72.
Heat	97,	————	97.
Weight	114lb.	————	the same.
Ditto yesterday	115.		
	<hr/>		
Difference lost	1.		

Urine 4 pounds 7 ounces; it is clear, but of a sweetish taste.

He disliked the fish, and said it was not so satisfying to his appetite as the meat; he thinks his thirst and appetite are more craving. He had a very good night, with some perspiration over the whole body; griping quite left him; and flatulency greatly relieved.

It seems to be no longer necessary to continue the bath, for the purpose of deciding on the question respecting absorption, as by the foregoing account it appears, that in this case at least, no such thing

thing has occurred. For in no one instance has there been any sensible increase of weight after bathing, except on the 12th February, when it is satisfactorily accounted for, and that must have happened if any absorption had taken place during his continuance in the bath. It therefore seems fair to conclude, that if it did not exist in that situation, it could not under the ordinary circumstances of the body.

Ordered the bath to be omitted, but the register of the weight of the body to be continued.

21st.

He weighed this day, 114 lb. 7 oz.

———— Yesterday, 114.

Difference gained — 7 oz.

Urine 3 pounds, 14 ounces; it is clear, and not so sweet as yesterday.

He was very uneasy in the night, and got no rest, though he took two draughts, with 40 drops of laudanum in each. His appetite and thirst are increased. A few drops of blood, which was thin and florid, issued spontaneously from his nose, and it appears he was frequently subject to it when a boy, but has not been troubled with it for these 15 years past.

22d.

He weighed this day,	112 lb. 4 oz.
———— Yesterday,	114 7.
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Difference lost,	2 3.

Urine 5 pounds, 6 ounces, clear, and having a mixed smell, sweetish and urinous.

He has slept better, though he complains of aching pains in all his joints and small of the back, which commenced with chilliness, and has continued these two days.

23d.

He weighed this day,	112 lb. 8 oz.
———— Yesterday,	112 4.
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Difference gained,	— 4.

Urine 3 pounds 12 ounces.

He has had a disturbed night; was extremely hot, but did not sweat; his pains are easier, but he complains of fullness after eating, and an acute pain across the stomach; was more flatulent and sick, so as even to vomit a little; thirst and appetite increase.

24th.

He weighed this day,	112 lb. 1 oz.
———— Yesterday,	112 8.
	<hr/>
Difference lost,	— 7.

Urine

Urine 5 pounds 7 ounces.

The pain in his head and limbs continues, as also the sense of fullness at his stomach, which extends to the small of his back and shoulders, and is attended with almost constant eructations

25th.

He weighed this day,	112 lb. 7 oz.
———— Yesterday,	112 1.

Difference gained, —	6.
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Urine 4 pounds 6 ounces.

He was very much troubled with flatulency all night; his appetite is not so strong, but the thirst is more so. The pain he complained of in the back and joints is quite gone, and that in the head is easier, yet the pulse was 90, and the heat 100. Æther and ammonia were ordered in a mixture, portions of which were to be taken occasionally; and he was also directed to take an emetic.

26th.

He weighed this day,	111 lb. 14 oz.
———— Yesterday,	112 7.

Difference lost	9.
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Urine 6 pounds $2\frac{1}{4}$ ounces. In order to decide more accurately as to the sweetness of the urine, than can be determined by the taste, I directed
some

some yeast to be added to it, to try if it would ferment.

He has had a restless night, and vomited frequently till 3 o'clock in the morning; his spirits are better, and he thinks himself stronger. He had a pudding made of milk, suet, and eggs, for his dinner, which he was fond of.

27th.

He weighed this day,	112 lb. 12 oz.
———— Yesterday,	111 14.

Difference gained,	14.
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Urine 3 pounds 9½ ounces. A sensible fermentation commenced in the urine in half an hour after the yeast was put to it, and it continues.

The sickness is gone, but he was restless in the night, and slept little; the pain in his stomach continues, and his thirst increases; his appetite lessens, and he feels uncomfortable after eating, and is weaker. Pulse 90. Heat 100.

28th.

He weighed this day,	112 lb. 12 oz.
———— Yesterday,	112 lb. 12 oz.

Urine 3 pounds 11 ounces.

The diet, with the pudding of milk, eggs, and suet, were given as directed.

He has had a considerable and general perspiration.

tion last night; his thirst and appetite are moderate; and he is quite free from pain.

29th.

He weighed this day,	112 lb.	6 oz.
———— Yesterday,	112	12.
Difference lost,	—	6.

Urine 3 pounds 15 ounces.

He took a pudding composed of blood and milk, mixed whilst they were both warm with some suet, but he did not like it. His stools have become much more natural since the milk he takes has been cooked.

30th.

He weighed this day,	112 lb.	11 $\frac{3}{4}$ oz.
———— Yesterday,	112	6.
Difference gained,		5 $\frac{3}{4}$.

Urine 3 pounds 5 ounces, clear, but not sweet.

He has had a good night, continues well, and perspires moderately.

31st.

He weighed this day,	113 lb.	13 oz.
———— Yesterday,	112	11 $\frac{3}{4}$.
Difference gained,	1	1 $\frac{1}{4}$.

P

Urine

Urine 5 pounds 10 ounces ; it is higher coloured, yet rather sweet ; and deposits a light white sediment.

He continues better, and feels a more comfortable warmth than he has been accustomed to do lately. His pulse has been from 85 to 90 for a week past. He is so tired with broth, that he has refused to take any for some time, and owing to his fondness for the eggs and milk, either baked or boiled with suet, he has eaten too little meat lately. I therefore ordered that he should at least eat one pound daily.

April 1st.

He weighed this day,	113 lb.	12 oz.
———— Yesterday,	113	13.

Difference lost,	—	1.
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Urine 5 pounds ; it has no sediment.

He is much as yesterday.

2^d.

He weighed this day,	111 lb.	7 oz.
———— Yesterday,	113	12.

Difference lost,	—	2	5.
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Urine 4 pounds 8 ounces.

The griping, with some flatulency, has returned, and he has not slept quite so well.

The

The urine that was set to ferment on the 26th of last month still keeps a head of yeast upon it ; it has become sensibly sour, but not putrid.

3d.

He weighed this day,	112 lb.	15 $\frac{3}{4}$ oz.
———— Yesterday,	111	7.
	<hr/>	

Difference gained, — 1 8 $\frac{3}{4}$.

Urine 4 pounds 6 ounces ; it is sweetish.

The flatulency continues, and he was both vomited and purged in the night ; he had some perspiration.

4th.

He weighed this day,	114 lb.	7 $\frac{1}{2}$ oz.
———— Yesterday,	112	15 $\frac{3}{4}$.
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Difference gained, 1 7 $\frac{3}{4}$.

Urine 3 pounds 14 ounces. To this urine I ordered some yeast to be put.

He was easier, and slept better last night ; the diarrhoea and sickness are gone ; the flatulency is abated ; the appetite and thirst are moderate.

5th.

He weighed this day,	113 lb.
———— Yesterday,	114 7 $\frac{1}{2}$ oz.
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Difference lost, — 1 7 $\frac{1}{2}$.

P 2

Urine

Urine 4 pounds 1 ounce.

He feels much as yesterday.

6th.

He weighed this day, 113 lb. 14 oz.

———— Yesterday, 113.

Difference gained, — 14.

Urine 5 pounds 13 ounces.

It becomes very irksome to keep him to animal food, even with a very large allowance of milk; and I learn that he takes the suet off the milk when it cools. He feels himself better to-day. He continues the animal food with milk, eggs, &c.

7th.

He weighed this day, 111 lb. 14 oz.

———— Yesterday, 113 14.

Difference lost, 2.

Urine 4 pounds 14 ounces; it is higher coloured, and not sweet. The urine which had some yeast put to it on the 4th, did not ferment, and the smell of volatile alkali is now become very pungent in it.

He used the warm bath to cleanse his skin, when a large quantity of the dead cuticle came off. Let him try the cold bath a few times.

8th.

8th.

He weighed this day,	114 lb.
———— Yesterday,	111 14 oz.
Difference gained,	— 2 2.

Urine 4 pounds 13 ounces; it is not sensibly sweet.

He felt very warm and comfortable after the cold bath, and rested well at night; his appetite and thirst are moderate.

9th.

He weighed this day,	113 lb.
———— Yesterday,	114.
Difference lost,	— 1.

Urine 5 pounds 1 ounce, not sweet.

The diarrhoea returned in the night.

10th.

He weighed this day,	112 lb.
———— Yesterday,	113.
Difference lost,	— 1.

Urine 5 pounds 7 ounces. This was put to ferment.

He was troubled with griping in the night, and did not sleep well.

11th.

He weighed this day,	113 lb.
———— Yesterday,	112.

Difference gained,	—	1.
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Urine 6 pounds. The urine set aside yesterday did not ferment in the least, and the effluvium of volatile alkali from it, is already very pungent. I have ordered it to be tried in the same manner, every other day.

He rested better in the night, and was free from griping; in other respects much the same.

12th.

He weighed this day,	114 lb.
———— Yesterday,	113.

Difference gained,	—	1.
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Urine 4 pounds 10 ounces.

He went into the cold bath again, and felt much refreshed.

13th.

He weighed this day,	115 lb.	4 oz.
———— Yesterday,	114.	

Difference gained,	—	1	4.
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[Urine 4 pounds 5 ounces.

He continues much the same.

14th.

14th.

He weighed this day, 114 lb. 6 oz.

Yesterday, 115 4 oz.

Difference gained, — 14.

Urine 3 pounds 15 ounces ; it has a natural smell, does not ferment, and becomes alkalized very quickly.

He was troubled with flatulency and purging in the night.

15th.

He weighed this day, 116 lb. 6 oz.

Yesterday, 114 6.

Difference gained, — 2.

Urine 5 pounds 2 ounces.

He appears to be in a better state than he has yet been, and has gained 4 lb. 6 oz. in weight since the 10th.

16th.

He weighed this day, 116 lb. 7 oz.

Yesterday, 116 6.

Difference gained, — 1.

Urine 3 pounds 2 ounces. This is set to ferment in two portions, one of which has yeast added to it, the other not ; two portions of healthy urine are also put under the same circumstances. For, I apprehend that in the two last experiments that

were made in this way, the urine became more highly alkalescent, volatile, and pungent, and in less time than healthy urine generally does; and though I did not think it likely to be the effect of adding yeast to it, but possibly that of its being placed in a warmer temperature, for the purpose of favouring fermentation, I thought the fact would only be decided completely by placing both the diabetic and the healthy urine with yeast, and without it, in the same temperature.

17th.

He weighed this day,	114 lb. 12 oz.
———— Yesterday,	116 7.

Difference lost, —	1 11.
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Urine 4 pounds 4 ounces.

No fermentation took place in any of the four portions of urine, but the two diabetic ones are very pungent and volatile, with very little difference betwixt the two; there is, however, a great difference betwixt them and the portions of the healthy urine, neither of the latter having undergone much change.

18th.

He weighed this day,	115 lb. 8 oz.
———— Yesterday,	114 12.

Difference gained, —	12.
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Urine

Urine 4 pounds 13 ounces.

He went again into the cold bath, and felt refreshed as before.

19th.

He weighed this day, 115 lb. 8 oz.

———— Yesterday, 115 8.

Urine 3 pounds 1½ ounce.

The diet is continued.

20th.

He weighed this day, 114 lb.

———— Yesterday, 115 8.

Difference lost, — 1 8.

Urine 3 pounds.

21st.

He weighed this day, 115 lb.

———— Yesterday, 114.

Difference gained, — 1.

Urine 1 pound 15 ounces ; the urine of yesterday was set to ferment, but it has shown no appearance of it ; it has become alkalescent, imparting a volatile smell.

22^d.

He weighed this day, 111 lb. 12 oz.

———— Yesterday, 115.

Difference lost, — 3 4.

Urine

Urine 2 pounds 12 ounces.

The diarrhœa and griping have returned, and they occasioned him to have a bad night.

23^d.

He weighed this day,	112 lb.	
———— Yesterday,	111	12 oz.
	<hr/>	
Difference gained,	—	4.

Urine 2 pounds 2 ounces ; it continues to become alkalescent very rapidly, and will not ferment.

24th.

He weighed this day,	111 lb. 12 oz.
———— Yesterday,	112.
	<hr/>
Difference lost,	— 4.

Urine 2 pounds 5 ounces.

He has used the warm bath as a wash to the skin, which still rubs off.

25th.

He weighed this day,	114 lb.
———— Yesterday,	111 12 oz.
	<hr/>
Difference gained,	— 2 4.

Urine 3 pounds 8 ounces.

Finding that he has upon the whole been losing weight since the 17th, I questioned him very closely

closely about his getting other food than what was allowed him, but he denied it, and shewed much impatience about staying longer with us, saying that he thought himself well and strong again, and that he would rather go, as he was watched like a thief. Though I do not consider him to be so well as he thinks he is, yet as the quantity of his urine is so much reduced, and its former nature so entirely reversed, I have, notwithstanding his having lost weight, allowed him four ounces of flour in his pudding, and two ounces of bread with his meat; for fear he should run away, and leave us uncertain of the event.

26th.

He weighed this day,	116 lb.	3 oz.
———— Yesterday,	114.	
	<hr/>	
Difference gained,	— 2	3.

Urine 3 pounds 1 ounce.

27th.

He weighed this day,	115 lb.	4 oz.
———— Yesterday,	116	3.
	<hr/>	
Difference lost,	—	15.

Urine 3 pounds 12 ounces.

28th.

28th.

He weighed this day, 117 lb. 8 oz.

Yesterday, 115 4.

Difference gained, — 2 4.

Urine 3 pounds 7 ounces ; it is set to ferment.
 He continues the same ; and was in the cold bath.

29th.

He weighed this day, 115 lb. 8 oz.

Yesterday, 117 8.

Difference lost, — 2.

Urine 3 pounds 3 ounces ; yesterday's urine does not ferment.

He had a copious perspiration in the night, which continued about four hours.

30th.

He weighed this day, 116 lb. 14 oz.

Yesterday, 115 8.

Difference gained, — 1 6.

Urine 3½ pounds.

He perspired a little in the night.

May

May 1st.

He weighed this day,	115 lb.	12 oz.
———— Yesterday,	116	14.
	<hr/>	
Difference lost, —	1	2.

Urine 3 pounds 9 ounces.

He perspired much in the night, but it does not weaken him. He went again into the cold bath.

2^d.

He weighed this day,	113 lb.	8 oz.
———— Yesterday,	115	12.
	<hr/>	
Difference lost, —	2	4.

Urine 4 pounds 1 ounce ; it is again put to the test of fermentation.

He has perspired much.

3^d.

He weighed this day,	113 lb.	
———— Yesterday,	113	8 oz.
	<hr/>	
Difference lost, —		8.

Urine 3 pounds 5 $\frac{1}{4}$ ounces. Yesterday's urine does not ferment.

The diarrhœa is returned ; the perspiration is moderate.

4th.

4th.

He weighed this day,	113 lb.	1 oz.
———— Yesterday,	113.	

Difference gained,	—	1.
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Urine 2 pounds 15 ounces.

He was in the warm bath, when much of the old cuticle came off; his skin has still a rough harsh feel, though much softer than it was at first.

5th.

He weighed this day,	113 lb.	8 oz.
———— Yesterday,	113	1.

Difference gained,	—	7.
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Urine 3 pounds 14 ounces.

He sweat none last night.

6th.

He weighed this day,	117 lb.	
———— Yesterday,	113	8 oz.

Difference gained,	—	3	8.
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Urine 3½ pounds.

I have at length discovered, through the information of another patient in the same ward, that Clarke adhered rigidly to the regimen prescribed him, only for about 14 days at the first.

In the course of the disease we have often had
reason

reason to suspect that he was deviating from our plan, and three or four times the necessity of a strict attention on his part was particularly insisted on. After these cautions he attended to his regimen strictly for a day or two, but again relaxed, through the almost irresistible propensity to more or less of vegetable diet, which seems to be one of the characteristic symptoms of this disease. With these exceptions, it appears that he has generally partaken with the other patients in the common mixed diet of the house, and that he has drank water when thirsty, if he had no milk. I cannot learn that he ever gave any part of the flesh meat to the other patients.

It is extremely vexatious to have been so much deceived, yet I don't think it lessens the inference, that animal diet has been the means of effecting the very great alteration in the quantity and quality of his urine; for though he has eaten more promiscuously than was supposed, he has at all times taken a large proportion of animal matter, and a marked effect has at different periods of the disease followed the more entire use of it, particularly in the beginning, when his apprehension made him adhere rigidly to the plan.

The discovery, though vexatious, has perhaps made this a better case, in as much as it shews that an absolute exclusion of vegetable matter is not necessary, at least not for so long a time; and
also

also as it proves that he is nearer being cured than he was thought to be, by the characteristic symptoms of the disease not having been reproduced by the superior quantity of vegetable matter he has eaten to what he was supposed to have done. Whether his appetite is so strong as to constitute it a remnant of the disease I know not; but from the impossibility of restraining him, and for the purpose of ascertaining whether the cure was complete, he is ordered to have the diet of the house only.

NOTE.—*From the discovery of the patient's deviations, the daily weight of each particular article of food and drink forming the ingesta, and the weight of the egesta, except the urine, have been omitted in the reports. Had he been correct, such an account would have made the detail of the case complete: they have been erased at the request of Dr. Gerard.*

7th.

He weighed this day, 115 lb. 10 oz.

———— Yesterday, 117.

Difference lost, — 1 6.

Urine 4 pounds.

His diet now consists of milk, meat, potatoes, and bread.

8th.

8th.

Having found the actual weight of the body to differ so much from day to day, I ordered him to be weighed upon getting up each morning, instead of at 4 o'clock in the afternoon, conceiving that that difference might be occasioned by the additional weight of a more copious indigested meal one day than the other.

9th.

He weighed this day,	111 lb.	8 oz.
———— on the 7 th ,	115	10.

Difference lost in 38 hours,	4	2.
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Urine during 38 hours, 7 pounds 10 ounces.

10th.

He weighed this morning,	110 lb.	10 oz.
———— Yesterday,	111	8.

Difference lost,	—	14.
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Urine 5 pounds 12 ounces.

11th.

He weighed this morning,	112 lb.	
———— Yesterday,	110	10.

Difference gained,	—	1	6.
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Urine 5 pounds 6 ounces.

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12th.

12th.

He weighed this morning, 112 lb. 8 oz.

 Yesterday, 112.

Difference gained, — 8.

Urine 6 pounds 7 ounces; it has not been sensibly sweet for a long time past; it was put by this day to ferment.

13th.

He weighed this morning, 111 lb. 12 oz.

 Yesterday, 112 8.

Difference lost, — 12.

Urine 6 pounds 2 ounces. Yesterday's urine did not ferment; but it is become strongly animalized, more like healthy urine, and not so very pungent from the vapour of volatile alkali, as it was about the middle of April.

14th.

He weighed this morning, 113 lb. 4 oz.

 Yesterday, 111 12.

Difference gained, — 1 8.

Urine 5 pounds 7 ounces. For some days his allowance of bread has been one pound, it is now two pounds daily.

15th.

15th.

He weighed this morning, 113 lb. 6 oz.

Yesterday, 113 4.

Difference gained, — 2.

Urine 5 pounds 6 ounces.

He has had more or less perspiration daily for some time past. He went into the cold bath.

16th.

He weighed this morning, 113 lb. 7 oz.

Yesterday, 113 6.

Difference gained, — 1.

Urine 5 pounds 6 ounces.

17th.

He weighed this morning, 112 lb.

Yesterday, 113 7 oz.

Difference lost, — 1 7.

Urine 4 pounds 10 ounces ; it is neither sweet, nor in any over proportion to the fluids taken in ; nor will it ferment, although he has lived chiefly on vegetable matter, and milk, since the 6th instant.

He has had copious perspirations these two nights past.

228

18th.

He weighed this morning,	112 lb.	4 oz.
———— Yesterday,	112.	

Difference gained,	—	4.
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Urine 5 pounds 4 ounces.

19th.

He weighed this morning,	111 lb.	1 oz.
———— Yesterday,	112	4.

Difference lost,	—	1 3.
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Urine 5 pounds 1 ounce.

20th.

He weighed this morning,	110 lb.	6 oz.
———— Yesterday,	111	1.

Difference lost,	—	11.
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Urine 5 pounds 6 ounces.

He gains strength, and improves so much in his general health according to his own feelings, that he becomes quite impatient of confinement.

21st.

He weighed this morning,	111 lb.	2 oz.
———— Yesterday,	110	6.

Difference gained,	—	12.
--------------------	---	-----

Urine 5 pounds 8 ounces.

22^d.

22d.

He weighed this morning,	112 lb.	4 oz.
———— Yesterday,	111	2.

Difference gained, —	1	2.
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Urine 4 pounds 15 ounces.

23d.

He weighed this morning,	112 lb.	12 oz.
———— Yesterday,	112	4.

Difference gained, —	8.
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Urine 5 pounds 7 ounces.

24th.

He weighed this morning,	111 lb.	4 oz.
———— Yesterday,	114	4.

Difference lost, —	1.
--------------------	----

Urine 5 pounds 1 ounce.

25th.

He was discharged from the Infirmary to all appearance cured of the disease; which, to his own thinking, has long been the case; and to the opinion of his being *even cured* I have no hesitation in subscribing.

He was enjoined to come up to the Infirmary once a week (as he said he should endeavour to

get work as a shoemaker in the town) to let me see how he went on; but I have reason to suppose he set out for Newcastle, his native place, that very day;—he can write, however, and has promised to let me hear from him, and to mention what weight he was; if he does so, I will not fail to inform you, should any material alteration ensue.

The following accounts of the Hepatified Ammonia are contained in different letters from Dr. Gerard.

BOTH DOCTOR CURRIE and myself think ourselves much obliged to you, and also to Mr. CRUICKSHANK, for the phial of hepatified ammonia sent by him, although we have not used any of it in our diabetic case. I have, however, given a few doses in some others, which Dr. Currie has seen with me; and from the observations of one of my patients, I have learned that the first dose always produced a sensible effect, and was followed by sleep; but not the subsequent ones that had been mixed longer. The same observation has been confirmed in a boy who took it, under psoas abscess. I have tried it more fully in a case that may, perhaps, be called hysteric insanity, and have got to 10 drops at a dose three times a day; but have perceived very little sensible effect, unless the becoming calmer, and more moderate in her
behaviour

behaviour for these three days past, may be considered as such.

We have now got the hepatifed ammonia well prepared; and I have given the patient I mentioned before 17 drops at a dose, but without any sensible effect.

Some REMARKS *on these* COMMUNICATIONS.

THE only circumstances leading to fix on the *predisposing causes of the Diabetes Mellitus* are contained,

1st. In DOCTOR FALCONER's letter, where a case of the disease is related, as having apparently been produced by excessive indulgence in spruce beer, to reduce corpulency.

2d. In DOCTOR CLEGHORN's first case, where the patient had worked hard while under convalescence from fever.

3d. In the case of the Gentleman of 77 years of age, who had been addicted to the use of large quantities of sugar.

4th. In DOCTOR GERARD's case, the patient had been subject to pyrosis, and liable to much perspiration previous to the diabetic attack.

With regard to the *nature of the disease*, DOCTOR BAILLIE's account, in the manner we have received it, furnishes no inference, but what may

be referable to the sequelæ of the disease. Since then, however, an alteration of opinion has been suggested in the last edition of his *Morbid Anatomy*. “ Opportunities do not frequently occur of examining the state of the kidneys in Diabetes. I have once, however, been able to make this examination in a satisfactory manner, where a person had been long affected with Diabetes, and had been a patient under my care at St. George’s Hospital. In both kidneys the superficial veins were much fuller of blood than usual, forming upon their surface a most beautiful network of vessels. The whole substance of the kidneys was much more vascular than in a healthy state, approaching a good deal in appearance to what takes place in inflammation. In both of them there was a very small quantity of a whitish fluid, somewhat resembling pus; but there was no appearance of ulceration whatever. The artery, the vein, the lymphatic vessels, and the nerves of both kidneys, were in their natural state. The liver, at the same time, I examined with care, because it has been thought by some to be the chief source of disease in diabetic patients, but it was perfectly sound. The stomach and intestines were also examined with attention, but no appearances occurred in them which are not very common. From the state of the kidneys, upon examination, it seemed to me probable that Diabetes depends, in a considerable

derable degree, upon a deranged action of the secretory structure of the kidneys, by which the blood there is disposed to new combinations. The effect of these combinations is the production of a saccharine matter. I think it probable, at the same time, that the chyle may be so imperfectly formed, as to make the blood be more readily changed into a saccharine substance, by the action of the kidneys. This opinion, however, is proposed with much diffidence." *Second Edition of Morbid Anatomy, page 275.* DOCTOR BAILLIE, therefore, has now, to a deranged action of the kidneys, added an imperfectly formed chyle. While he retains the opinion that the saccharine matter is formed in the kidneys, he thinks the imperfect chyle may make the blood be more readily changed into this saccharine substance by the action of the kidneys. This conjecture is of importance, as the principles of the treatment derived from it, must comprehend a morbid condition of the stomach as well as of the kidneys; and so far has DOCTOR BAILLIE made a progress in opinion towards our views of the disease, since the dispersion of the Notes of Captain Meredith's Case.

MR. ABERNETHY found the serum of the blood *turbid*; and he observed, that sugar taken into the stomach, increased the saccharine matter in the urine.

With

With respect to the *treatment of the disease*, DOCTOR DUNCAN found, in one case, fat meats serviceable.

DOCTOR FALCONER recommends the mephitic alkaline water; and from the advantage the Gentleman of 77 derived from Schweppe's soda water, it may be of service. There is no doubt it will relieve the acescency of the stomach. We would prefer the soda water, as we think it may act less on the kidneys than that made with the vegetable alkali.

DOCTOR BEDDOES mentions a case where the Bristol water cured the disease.

DOCTOR CURRIE has seen several cases of the disease; but never saw a case of it with sweet urine cured.

THE CASE OF WALKER shews the effects of the animal food. It was begun on the 29th December, when the daily quantity of clear sweet urine amounted to 13 pounds; on the 31st day, being two days only, the quantity of the urine was reduced to 5 pounds, and it had acquired a strong urinous smell.

THE TWO CASES, treated at GLASGOW, by DOCTOR CLEGHORN, shew also the good effects of the animal food, and of the influence of commotions in the bowels on the quantity of the urine.

THE

THE CASE of the GENTLEMAN of 77, likewise shews the efficacy of animal food ; but the most STRIKING CASE is that of CLARK, as related by DOCTOR GERARD.

This important case points out,

1st. That in this disease there is no absorption of fluids by the skin.

2dly, That animal food may alone, if duly persevered in, cure the disease ; and such perseverance may probably be of a very limited duration.

HEPATISED AMMONIA.

This medicine was given by DOCTOR CLEGHORN ; but he has acknowledged that it had not been properly prepared, and therefore he withdraws the opinion he had formed on its trial in his two cases.

DOCTOR GERARD has given it with sensible effect, though in one case to the quantity of 27 drops without any, yet this may have arisen from the gradual increase of the dose.

In our second case, we could only go as far as 12 drops, four times a-day ; and in that of Captain Meredith very powerful effects were produced ; but then he had taken accidentally and suddenly, without a gradual increase of the dose,
a considerable

a considerable number of drops, probably exceeding twenty.

We are satisfied that it is a powerful medicine ; but it must be prepared according to Mr. Cruickshank's method ; and the ammonia must be pure, and completely saturated with the hepatic gas. To produce its narcotic effects, full and sudden doses of it must be given ; but these require judgment, and an acquaintance with the exhibition of the medicine. It should not be mixed up in draughts, or in any other form, as it is so readily decomposed ; but must be dropped from the phial, at the time of using, into a proper vehicle (distilled water is the best), and taken immediately.

NITROUS ACID.

DOCTOR CURRIE is fully satisfied of the effects of this remedy in the treatment of the Lues Venerea.

DR. TROTTER mentions that three cases of inveterate syphilis had been cured at PORTSMOUTH, by the same medicine.

SECT. II.

CASES *and* COMMUNICATIONS *since the first Edition of the Work.*

From DOCTOR MARCET.

London, January 12, 1798.

MY friend and countryman DOCTOR DE LA RIVE, having informed me that WALKER had been re-admitted into the *Infirmary* at *Edinburgh*, and placed under the care of DOCTOR GREGORY, I requested him to send me an account of the further progress and treatment of the case, which I now have the pleasure to transmit to you.

Continuation of the CASE of WALKER.

June 12th, 1797.

He had continued perfectly well till within this fortnight, though his urine, which amounted to $5\frac{1}{2}$ lb. when he left the Hospital, increased gradually to 16 lb. His thirst is at present urgent; his tongue is dry, as well as his skin, which is also hot; says that he sweats frequently; pulse 108.

He

He complains of a burning pain in the palms of his hands and soles of his feet; of considerable weakness, and occasional sourness in his stomach, with pain and flatulence. His sleep is disturbed; his ancles often swell at night.

14th.

In the last 24 hours he has passed 17 lb. of urine, which is of the common diabetic appearance. *Sulph. pulv. alum. comp. ʒss. 4. in die; libat aquæ calcis 2 lb. in die.* Full diet, with meat for dinner.

17th.

Urine 16 lb. The dose of the compound powder of alum to be increased to a drachm.

19th.

Urine 14 lb. and rather more limpid. The alum powder to be omitted, the lime water continued, and an entire diet of animal food to be adopted, consisting of the following articles; three eggs for breakfast, four ounces of cheese for supper, two pounds of meat for dinner, with three pounds of beef-tea in the day.

21st.

Urine 8 lb. still pale, though less so than before.

29th.

29th.

Urine 5 lb. yellower than it has yet been, and of a more natural smell.

July 7th.

Urine 5 lb. To be allowed 4 ounces of bread daily, in addition to his diet.

9th.

Urine 5½ lb. He has drank two cups of tea with sugar.

11th.

Urine 5½ lb.; a portion of yesterday's was evaporated, and the residuum evidently contained saccharine matter.

16th.

The bread to be omitted, and the animal diet strictly adhered to.

27th.

Urine 5 lb. Within these few days his strength has been recruited. He is to be discharged.

This Patient was detected in following his habits of irregularity and intemperance; indeed he could not be depended upon.

From

From DOCTOR GERARD.

Liverpool, 15th May, 1798.

IN compliance with your request, I shall give you a short account of two cases of Diabetes Mellitus, which have fallen under my care at our Infirmary since that of *Clarke*, who, by the way, I must tell you, has never been heard of since he was discharged.

They were both females. MARY JACKSON, aged 57, was very much reduced indeed, when she was admitted in July last. She had had 13 children; the last 7 years of age. The disease commenced about July 1796, but was not attended with any particular circumstance, except an uncommon itching about the meatus urinaris, which returned at intervals, and was always attended with an increased flow of urine. She remarked, that upon the occurrence of a spontaneous vomiting, which continued several days, her water was reduced in quantity one half, but when the vomiting subsided, the quantity became as great as before.

She was put upon the animal diet, and in the course of eight or ten days was better, to her feeling, though the urine was little altered; her appetite and thirst were more moderate, her spirits and complexion improved, and the skin, which had been

been very harsh and dry, had yielded to moderate perspiration, and was become much softer. She frequently took an opiate, and occasionally an emetic ; and upon the disease proving obstinate, I ordered her five drops of hepatised ammonia three times a day ; the dose was gradually increased to 20 drops, which was repeated five times in the 24 hours, without producing any lasting amendment.

Not meeting with the same success in this case as I had experienced in Clarke's, I determined to give her the carbonated ammonia in very full doses, which I was led to make trial of, both from the late discovery of its component parts, and also from the consideration of its being so copiously afforded by healthy urine, and animal matter in general, and therefore corresponding with the plan of animal diet. I also found a further inducement to persevere in this plan, upon hearing that Dr. Currie, of Chester, had succeeded in a case where he had made use of it. It was continued from August to December, and for a great part of the time, to the quantity of \mathfrak{z} iv daily, one half in the form of pills, and the other in solution, saturated with carbonic acid air. It failed, however, in this instance, for she died on the 13th of December ; but it must be remarked, that she was continually deviating from the plan, in eating different vegetable matters, and particularly sweets ; but this did not come to my knowledge till it was too

R

late ;

late; the fact, however, was proved beyond a doubt. The want of success in this instance, cannot, therefore, with any propriety, be attributed to the insufficiency of the plan.

My other Patient, ELIZABETH FRANCIS, aged 36, is a married woman. She miscarried near 12 years ago, but never had a live child. Eighteen months after that, she became dropical, and had 17 quarts of water drawn off by the operation of paracentesis. She recovered of this, and enjoyed tolerable good health for near five years; but she has been complaining these four years past, and became diabetic about June 1797. She was admitted into the Infirmary on the 28th of September following, at which time Mary Jackson was using the carbonated ammonia, and apparently with advantage. Francis was therefore ordered to take it in the same manner, and to pursue the animal diet; I believe she did so rigidly, and with so good an effect, that on the 12th of November she was discharged at her own request, in consequence of feeling herself better than she had been for four years before, and indeed, to her own thinking, well; her strength being much improved, her thirst and appetite very moderate, and her water reduced to four, and sometimes to three pints in the 24 hours, and free from sweetness, though for a week before she left us, she had been allowed two ounces of bread per day, and for the week preceding that, one ounce

ounce per day. On her going home, however, she increased it to a penny loaf per day, and at the same time took less animal food, owing to her inability to procure it; the consequence was, that in a few weeks she became somewhat weaker, her urine increased a little, and she was frightened. She was therefore re-admitted on the 13th of February, and put again upon the animal diet, which she adhered to strictly till the 29th of March, when she was discharged again, to all appearance cured of the disease, though not restored to the strength and vigour of full health.

She still keeps to the plan of eating animal food, and avoiding all vegetable matter, but lives a good deal upon milk; and when I called upon her yesterday, she said she had certainly gained strength lately. I then learned, for the first time, that she had also been affected two different times with an itching about the meatus urinarius, which was exceedingly troublesome to her; the water was increased in quantity each time, and was hot and acrimonious; but she has had no return of it since she left the Infirmary.

I shall now conclude this account with remarking, that the effects of the animal diet have been so obvious in all the three cases under my care, notwithstanding two of them occasionally deviated very largely, that I perfectly agree with you, in suspecting a deviation from the plan, wherever

they are wanting, though the patient should strenuously deny it; for I have experienced the same propensity to deviate, and the same reluctance to acknowledge it, that you have done; and so averse are the other patients to betray the secret, that I believe the truth will seldom be obtained in an Hospital, whilst the patient remains there.

From DOCTOR CLEGHORN.

Glasgow, June 12, 1798.

TOGETHER with the conclusion of JOHN M'LEAN'S CASE, I have sent a short account of four other Patients, cured according to your plan in our Infirmary. As they were chiefly under the care of my learned Colleague, DR. FREER, (for I attended them only during a few weeks in his absence) I requested him to write out their cases; but after considering them, he found them so exactly like those already published, that he thought a full detail of the symptoms or practice would lead to unprofitable repetitions. With his concurrence I have extracted the following particulars from the Infirmary Registers.

One of the Patients was a *Weaver*, æt. 35, of a dark complexion and stout make. The disease had continued 18 months, and arose, as he thought, from cold, to which he was exposed while under
salivation

salivation from mercury. When admitted on the 9th of February, 1798, his urine, which was very sweet, amounted to 20 lib. daily; when dismissed, in the beginning of May, it varied from 4 to 5 lib. and had no sweetness.

This Patient got no hepatised ammonia. He was restricted to animal food, using water, lime water, or alum whey, for drink; he got occasionally laxatives, emetics, and pills containing extract of bark and steel. While he got eggs for supper, his appetite and thirst began to increase, for which reason they were omitted; but the chief peculiarity of his case consisted in the trifling effect of emetics upon him. Ten grains of tartarised antimony excited no sickness, no vomiting or purging; seven grains of vitriolated copper with the same quantity of ipecacuan, were equally ineffectual, as was also vitriolated zinc given to the extent first of 30, afterwards of 35 grains.

I do not ascribe this insensibility of the stomach to Diabetes, because I never met with it in other cases; it certainly arose from a constitutional peculiarity, as the Patient told me it had always been very difficult to make him vomit.

In other respects his progress was quite similar to that already often described. His skin, formerly arid, became soft and moist; in proportion to the abatement of his appetite and thirst, he gained flesh and strength; and his urine, acquir-

ing daily more and more of the natural appearance, during the last month of his stay in the Infirmary, most frequently amounted to 4, but never exceeded 5 lib.

Nothing has been heard of this Patient since he left Glasgow, from which, as he lives in the neighbourhood, we conclude that he continues well, because he promised either to return or to write, if he should relapse.

The other three patients were *women*, of whom one is married, aged 24, fair and delicate. Her disease began eight months ago, while she was giving suck, and she was very soon compelled to wean her child. She was admitted on the 8th of March, extremely weak and emaciated; her urine, which was very sweet, amounting daily to 15 lib. at least.

Together with animal food, laxatives, and emetics, she got hepatified ammonia; and for many weeks she has been so well that she is about to be dismissed cured.

The other Patient is a *widow* aged 29, of a fallow complexion. About four years ago, after delivery, she was dreadfully pained about the umbilicus, where a large tumour arose and suppurated. Matter flowed from it for six months, during which time she was reduced to extreme weakness; but the wound having closed, she recovered tolerable health, and enjoyed it till two years ago, when
Diabetes

Diabetes attacked her. She was admitted on the 19th of April, was treated in every respect like the last, and like her, is to be dismissed cured this week.

The third is an *unmarried girl*, aged 22. She was admitted June 5th, when her urine daily exceeded 14 lib. and was so sweet, that 1 lib. yielded ʒi. ʒvi. of thick sweet extract. Without the hepatised ammonia, in six days her urine has sunk to 6 lib. and has become bitter. Every other symptom has abated in equal proportion; so that in this case also a compleat cure may be confidently expected.

I am just now treating a *Gentleman* in private practice with equal success.

I examined JOHN ROGERS, (p. 168) to-day, and found that he had lived very irregularly. He keeps the *tap* in our prison, where he is much exposed to temptation; and his urine has from time to time become sweet, generally in proportion to his deviation from your rules; he is, however, much stronger, and has continued able to attend to his business.

JOHN M'LEAN, (p. 158,) died last year, in the beginning of August. A month before, he had been confined to bed by a violent pain darting from his breast to his back, accompanied with difficult breathing, and very severe cough. Having repeatedly recovered from similar attacks without medical aid,

he waited till the 10th day, though I had requested him to let me know whenever he began to complain.

On the 10th day of his disease I found him extremely hot and oppressed ; his breathing hot and laborious, constrained by dreadful pains through the chest, and frequently interrupted by a most severe cough ; by which, after violent straining, he brought up a quantity of pus or blood. His pulse was quick, and feeble, but sharp. His features were ghastly and expressive of great agony. His present were so different from his former feelings, that he gave up all hope of recovery, and in despair, not only refused to go again to the Infirmary, but was unwilling to try any remedies. Some of the ordinary ones, however, were used, to no purpose ; and in the fifth week of his disease, after voiding a quantity of blood by stool, he expired.

In the thorax were numerous adhesions, especially on the lower part of the sternum, from which the lungs could scarcely be separated, and the separated surfaces were covered with a gelatinous mass ; there were similar adhesions in the posterior part of the right cavity, nearly opposite, in which direction, chiefly, the pain had darted ; and also over a great part of the left cavity.

Around the adhesions the structure of the lungs was much altered. There were many ulcers, some nearly empty, others full of pus, and several parts
apparently

apparently ruptured, were surrounded with masses of grumous blood.

The bowels were very pale, but there was no hardness in any mesenteric gland. The kidneys appeared sound, only more flaccid than usual.

That the *pneumonia* which destroyed this Patient was not connected with *Diabetes*, is abundantly certain, but it may perhaps be thought, that the animal food necessary for curing the one, tended to produce the other. This is true, though I imagine the great fatigue, and the frequent alternations of heat and cold to which he was exposed, might have produced *pneumonia* under any regimen. Indeed, it seems probable that he had partial adhesions in the chest before he came to the Infirmary, because very slight causes excited cough and pain in the breast; but the last attack was most violent from the beginning, and the time when evacuations might have checked its progress was unfortunately allowed to go by.

I had the curiosity to taste his urine twice or thrice, but it was not sweet.

From some friends, to whom I have lent or recommended your work, (which is now known over all the west of Scotland) I have learned other instances of success; but, as I do not know the particulars, I think it unnecessary to mention them.

Last winter we had a complaint among horses, called by our Farriers *Jaw-pish*, marked by a great
flow

flow of clear urine, emaciation and weakness—lately I obtained a portion of the urine of a horse labouring under this disease, and found it sour; but I had not leisure to examine it farther.

Glasgow, July 6th, 1798.

IF your book be not printed off, perhaps you may think it necessary to mention the following circumstances, in addition to the cases which I lately sent you. Mr. *Baird*, Physician's Clerk in the Infirmary, inspected the Patient, and sent me the following account, which I have transcribed.

“ ISABEL HARVEY (the married patient) having nearly recovered her usual strength, and being completely cured of Diabetes, was dismissed from the Infirmary by DR. FREER, on the 13th of June. She continued well till the 21st, when her belly became costive, and she was seized with fever, attended with acute pain and tension over all the belly. (She went home, four or five miles from Glasgow; no person was called, consequently nothing was attempted for her relief.) On the morning of the 22d, the disorder increased; in the forenoon she became delirious, and in the evening she lay quiet for about two hours, when she expired.

“ On opening the body, 36 hours after death, the following appearances were observed.

“ All

“ All the thoracic viscera were perfectly sound. In the abdomen, the small intestines appeared loaded with red vessels, as did several parts of the *Colon* also, particularly about two inches above the *Cæcum*, where several spots of a black colour, and easily torn, were interspersed among the red. The whole colon was much distended with air, the lower part, from the sigmoid flexure to the neighbourhood of the anus, being plugged up with hard fæces.

“ The kidneys were enlarged, uncommonly soft, and pale.

“ The liver, spleen, pancreas, and mesenteric glands, were sound.”

The widow whom I mentioned, still continues in the Infirmary; and concerning her Mr. Baird sent me the following report, which I give in his words.

“ For the last eight weeks her appetite and thirst have been nearly natural; and though, along with animal food, she has had 1 lib. of sweet milk and a roll daily, her urine has retained the natural taste and smell, and has rarely exceeded $4\frac{1}{2}$ lib. daily. A few weeks ago, several phlegmons rose on her hands, and remained very painful for ten days, during which time she had little appetite, and became languid and listless. These phlegmons are now whole; her skin is soft; her appetite and thirst are natural; she recovers strength daily, and
abating

abating occasional pains through the belly, her feelings are perfectly comfortable.”

These cases shew the great danger of inflammation after the cure of Diabetes by animal food; a danger which increases in proportion to the preceding debility of the Patient, and against which it is necessary to be particularly on our guard.

From DOCTOR STORER, Nottingham.

October 18th, 1797.

THAT the cure of the Diabetes Mellitus had hitherto been a desideratum in Medicine, the candid declaration of Dr. Cullen will leave no room to doubt; and though I have reason to think that there exists in certain families a morbid disposition, occasionally shewing itself in profuse and sweet urine, thirst, eagerness of appetite, and feverishness, which is relieved by medicine, disappears of itself for a time, and recurs upon any irregularity, much as happens in dyspepsia, yet I think a distinction ought to be made between this milder and more chronic species of the disease and the true Diabetes Mellitus, with rapid emaciation, as described by yourself and others. Respecting the latter, (of which seven distinct cases have fallen under my care) I must say with Dr. Currie, that after the disease was completely
formed,

formed, I have never seen it cured by the former methods of practice.

The first notice I had of the new method, was from your notes of Captain Meredith's case, transmitted to me by Dr. Aldrich, (the Gentleman of 77, see page 180,) with a request to have my sentiments respecting the propriety of his pursuing a similar plan.

I have reason to think that the Doctor's disease had existed a considerable time, before it was detected in September 1796, when he first complained to me of œdematous legs, great thirst and dryness in the mouth, without any corresponding degree of fever, increasing debility and frequent irritation to urine, the quantity and properties of which had not been observed, the Doctor having strongly adopted the idea, that it was more the infirmities incident to advanced life, than any positive disease under which he laboured. Having declined to recommend any thing till the state of the urinary discharge was ascertained, I soon received a note to say, that the colour, taste, smell, consistence and saccharine residuum, after evaporation, all proved the urine to be truly diabetic. In consequence of this information, the Doctor was advised to give up all visits, and pass the winter entirely within his house, to abstain from vegetables, sweet and home made wines, to which he had been particularly partial, and all redundancy

dance of sugar, of which he was fond, and to pursue the plan of medicine stated in his letter to you. Under this treatment six months elapsed before your method was known to us, during which the Doctor was in some respects relieved; the progress of the Diabetes appeared to be arrested, but all its characteristic symptoms still remained. The sequel of the case, from the end of March till the 18th of May, (the date of the report transmitted to you) is better related by the Doctor himself, than I am able to do; to this report I have only to subjoin that on the 17th of June following,

He found himself able to pass two days here (20 miles from home) on a visit. The swelling of the ancles was no more than what is customary at his age; he appeared as well as he had been for several years; and though his urine had a slight sweetness, it was neither too abundant nor otherwise defective. This state of health continued, although he had in a great measure resumed an ordinary diet (abstinence from vegetables and saccharine matters excepted) till the 14th or 15th of July, when he was seized with a cholera, at a gentleman's house in the neighbourhood; and though the bowel affection ceased, so as to admit of his being removed home, yet on the 18th I found this truly excellent and learned man in a dying state, without any other symptoms than those of debility
and

and dyspnœa ; his urine was natural. The Doctor himself has stated that he would not consent to enter upon your plan of regimen in the strict manner that I would have recommended it to be pursued, at least for some weeks. He entirely rejected any hepatised ammonia, or any nauseating medicine. It was as a substitute for these that I proposed the soda water of Schweppe, having come to the knowledge of a diabetic case in Lancashire, which was understood to have been much relieved by that preparation ; and I entirely concur in the Doctor's own opinion, that while it was a solace to his thirst, he derived other advantages from it. In fine, the benefit he experienced from the whole of the plan, much exceeded his expectation and mine ; and I do not think, at his age, the cure could have been more complete.

It is with much concern I remark, that in patients under the influence of Diabetes, there is such an invincible desire for variety in aliment, and often such an aversion to animal substances, that the new method of treatment must often fail for want of a fair trial. I have at this time a man of about 50 under my care, who has laboured under this disease for two years, and who has had all along a disgust to the taste, smell, and often sight of animal food. Six months ago, I strongly recommended to him your plan of regimen ; he
tried

tried it partially, I believe, without much evident effect, and soon abandoned it. Taking advantage of the rapid increase of his disorder lately, and the near prospect of dissolution, if nothing essential was done, I have again enforced it with all my powers of language. The consequence has been, a fresh trial of two days, which he declares himself unable to support, and now he appears to resign himself to his fate.

April 30th, 1798.

I BEGAN practice with the conviction that the true Diabetes was a rare disease, and that the method of treatment was still a desideratum; of course I was on the watch for cases of this kind; and you will be surprized to hear me declare, after having had the care of a country Infirmary, where the yearly average of in-patients is 55, and of out-patients 300, from its first establishment in 1782 to this day, I have not met with a single instance of Diabetes Mellitus. During the same period, I have seen and treated for some length of time, in private practice, seven of what I call acute or severe cases of that disease, all of which (unless we except Dr. Aldrich's) terminated fatally; and indeed most of them were near their termination before the nature of the disease was discovered, although in every one, the quantity
of

of urine was excessive, the smell and taste luscious, and the quantity of molasses, obtained by evaporation, very great.

In the four first of the cases alluded to, I had no other views of the disease to guide my practice, but the opinion of some peculiar fermentative process in the alimentary canal, connected with a morbid state of its secretions, and by its continuance giving rise to an increased action, and, finally, to a laxity of the secretory vessels of the kidneys. To these views the regimen and remedies were accommodated, but without success. In those bad cases, which were also far advanced before they fell under my care, nothing that was advised gave even a promise of success, by retarding the progress of the disease. The Matlock and Bristol waters, which were tried in two of the cases, proved equally inefficacious.

The 5th case is that of Dr. Aldrich, the detail of which is in your possession.

The 6th came late under my care, when the urine amounted to 12 or 14 pints in as many hours, and furnishing a very large portion of saccharine and animal extract. The patient had been under the care of two other Physicians, and had used Matlock water without relief. As Dr. Aldrich was at that time pursuing your plan of treatment with success, I earnestly recommended it to him, but found that at this advanced stage of the disease,

ease, though he had a craving appetite for spoon meats, he had acquired such a disgust to animal food, and was withal so peevish, restless, and irrefolute, that no representation of its importance had more than a momentary effect on his mind.

The 7th instance was that of a Farmer in Derbyshire, to whom I was called in October last, a few days after I wrote to you, and only two days before his death, the true nature of his disease having never before been ascertained. Its first approaches were perceived in March 1797, by an unusual craving for food, which arose at all times of the day, and accompanied with faintness, dejection and fatigue, from the least exercise. This stage of the disease subsisted till July, before he perceived any increase in the urinary discharge, or was obliged to get up in the night for that purpose. From this period the progress of the disease was rapid; the urinary secretion was known to be very large, but its quantity was unascertained, and its sweetness (which was considerable) had not been noticed. The Patient, when I visited him, had been confined to bed for a week, with much seeming exhaustion, but no remarkable emaciation. Pulse 118. Frequent craving for food; excessive thirst; tongue very dry. I proposed, and strongly enforced, your plan of treatment, which was fully assented to; and I have reason to think, that in this instance it would have
been

been carried into compleat effect, had not the patient sunk so rapidly, and died within 48 hours of my visit.

This is the most decided instance that has ever fallen under my observation, of bulimia preceding, as well as accompanying the whole course of the disease; it began more than three months before the quantity of the urine was materially increased, and furnishes, as far as a single case can, the strongest presumption of a disease originating in the alimentary canal.

These are the instances of severe and strongly marked Diabetes that have occurred in the course of my practice; none of which yielded in any degree to the most approved methods of treatment hitherto known, that of Dr. Aldrich alone excepted, who by pursuing your regimen, as far as his age and strength would admit, and the use of Schweppe's soda water, was in less than two months so far recovered, that for six weeks preceding the attack of cholera which carried him off, he considered himself as cured of his former disease.

For the last twelve years I have begun to remark a case of disease, bearing all the characters of Diabetes Mellitus, but in so mild a degree, as readily to admit of relief from emetics, followed by the bark, conserve of roses, and mineral acids. This relief, however, has seldom been more than temporary; the symptoms being apt to recur on

the least irregularity, infomuch, that I know at this time two gentlemen, about 60, and both rather corpulent, who may be said to have been habitually liable to this disease for several years past, and probably for many years before it was noticed, without perceiving any other inconvenience from it, than occasional languor, a foul white tongue, quick pulse, considerable thirst, but no remarkable craving for food.

Both these gentlemen have had the lumbago and sciatica, and one of them in so great a degree, for several years past, as to be nearly deprived of the use of the lower limbs. At this time, and for months past, he has passed from 6 to 8 pints of sweet urine daily, 8 lb. 4 oz. of which furnishes, by evaporation, 1 lb. 6 oz. of sweet extract, of the consistence of thin honey.

This gentleman had the diabetic symptoms completely removed for several months, by the use of Bristol water, on the spot: and the same relief has been since that time twice obtained by a course of the Matlock water. Three years ago I recommended, on account of his rheumatic disease, a mercurial course, which was persisted in for 8 or 9 weeks, so as to maintain a considerable degree of soreness of gums; while this action was supporting, the diabetic symptoms entirely disappeared, but began to recur soon after it was laid aside.

Of this mild species of Diabetes, six instances
present

present themselves to my recollection in the last 12 years, and of these, three are of one family—one of the gentlemen above alluded to, his sister, and her daughter; and the gentleman tells me that his father died of the Diabetes. A young man, who consulted me several years ago, and was quickly relieved by emetics, tonics, and mineral acids, assured me that two of his aunts had, for many years, been afflicted with the same disease. In neither of these families does there appear to exist any other constitutional predisposition. One of them is remarkable for very fair hair, and blooming complexion, but no marks of scrophula. The only connection I have noticed, is that of lumbago and hepatitis chronica, concurring or alternating with several of the above cases of mild Diabetes. As far as I am informed, all the patients, except one, (who died of cancer in utero, at the age of 50) are yet alive; nor does it appear that any of them incur much hazard from the disease in question.

I do not know how far the distinction I have endeavoured to establish will be thought to infer a difference except in degree; in a practical view, it has served me important purposes, and I have no doubt it will be confirmed by the experience of others. It appears that Dr. Cullen had never seen an instance of the mild habitual or family Diabetes; on the

other hand, all the histories related by Morton, in his Chapter de Tabæ a Diabetes, were of that nature.

From DOCTOR JAMESON, Royal Artillery.

Tynemouth, 1st March, 1798.

ROBERT NIXON, a Collier, belonging to the works at Benton, about six miles from this place, of a slender make, dark brown hair and complexion, aged 22, and whom I visited on the 29th of December, 1797, informed me, that about two years since, he was induced to work very hard in the damp coal pits, which, he supposes, exceeded his strength and abilities, from an anxious desire to support his aged parents; that he then used to sweat greatly while at work in the mine, and to drink at the same time very freely of cold water, having no opportunity of procuring other liquor. From enquiry, I have reason to believe that he was not addicted either to inebriety or excess in eating, previous to the attack of his present disease: ardent spirits, I was assured, he never tasted; and no beer or ale-house being nearer his habitation on Benton Moor than two miles, he says he had neither inclination nor opportunity

portunity for procuring in the intervals of labour, the common, though perhaps necessary indulgence of malt liquor; and that he seldom tasted it oftener than once a week, and never drank to excess. His food, previous to, and since his indisposition, has been milk, or weak tea, and bread, in the mornings and evenings; fresh meat for dinner four or five times in the week, with a small proportion of vegetables; at other times fresh or salted fish, and occasionally pork; the colliers rearing hogs about their huts, in the same manner as is done by the negroes in the West Indies. The bread that the poor people use in this county, is a mixture of about equal parts of second flour and rye meal, of their own baking, and generally unleavened.

Since his sickness (at the same time that he has complained of constant thirst) he has also had a keen appetite, but I did not understand that it could at any time be termed voracious. He says he could eat heartily, and more than even himself thought prudent, as his food generally after eating lay heavy on his stomach, and, in his opinion, also increased his thirst; but he very seldom rejected his food or drink.

On the first attack he felt himself languid, and unequal to his customary exercise: had a particular weakness in his knees; pain in his loins; unpleasant dry sensation in the mouth and fauces,

with frequent desire for drink ; and in describing the progress of his complaint to me, he dwelt much on the excessive dryness of his skin, and entire want of perspiration from the beginning, which he was induced to take particular notice of, from having been remarkably disposed to sweat previous to his illness.

The debility, and other symptoms, obliged him to leave off work about 18 months since, and soon afterwards he put himself under the care of a Surgeon in the neighbourhood ; he also had the advice of a Physician in Newcastle.

Previous to his application for medical assistance, he had not attended to the sweetness or increase of his urine, though I have no doubt but that these symptoms existed also from the beginning of his other complaints.

The Physician and Surgeon whom he first consulted, pronounced his disease to be Diabetes, and put him under a course of astringents and the customary remedies. These he continued for some time, but with no permanent advantage ; he was therefore induced to discontinue all kinds of medicines for an interval of several months ; during which time his disease became gradually worse, and reduced him to a very feeble and emaciated state.

It was at this period of the disease, and after at least 18 months continuance, that he employed Mr. Burnet, (an ingenious young practitioner of the

the town of Shields) on the 10th of December; and I have been obliged to take the history of the symptoms and progress, previous to that time, from the patient himself, and his friends; as I have not the pleasure of knowing either of the two gentlemen under whose care he was at first, I have therefore endeavoured to be as accurate as possible in taking the minutes of the case before Mr. Burnet, in hopes they may tend to throw some light on the cause of the disease, or elucidate any circumstances connected with its future progress.

When Mr. Burnet first saw him, he made about 12 quarts of urine in 24 hours, (as measured by his sister) of a straw colour and sweet taste. His appetite keen, and thirst excessive, but the quantity drank during any particular period has not been hitherto ascertained. Bowels inclined to costiveness. Skin dry, and without perspiration. He had œdematous swellings of his legs, and was so weak as to be scarcely able to walk across the room. Pulse about 80. Restless at night, with frequent headaches.

He was directed to take on the 10th a grain of opium every night at bed-time; and as I had had an opportunity previously of conversing with Mr. Burnet on the subject of Diabetes, and giving him a perusal of your publication on that subject, he readily entered into the plan of cure suggested there; which the Patient was desired to adhere to rigidly as far as concerned the regimen; being
strictly

strictly forbid to eat any vegetable food, and to be guided in that respect by the rules you have laid down. He was, however, at the same time ordered an astringent mixture of bark and alum, of which he was to take a spoonful frequently; and this he continued until I saw him on the 29th.

During the interval from the 10th to the 29th of December, a quart of his urine had been evaporated on each of the following days.

On the 12th, leaving three ounces of a thick saccharine extract, in finell and appearance like treacle.

On the 20th, two ounces and a half of the same kind.

On the 26th, two ounces ditto; and on the 29th, one ounce and two drachms, evidently shewing a progressive degree of convalescence; which was also confirmed by a very considerable abatement of all the symptoms; his thirst in particular had almost left him, and the quantity of urine was diminished to about two quarts in 24 hours. He said he had made $5\frac{1}{2}$ quarts the last three days and nights previous to the 29th, as measured by himself. (The extract was weighed by Mr. Burnet.)

On the 29th, when I visited him, though he earnestly declared the great advantages of the plan he was pursuing, even in so short a time, he still, however, complained of considerable debility, some pain about his loins, and dryness of skin, with a degree
of

of restlessness and headach ; but his thirst and appetite were so moderate, that he found very little self-denial necessary now in abstaining from much food or drink.

His mixture had griped him, and occasioned a little sickness at stomach ; I therefore advised it to be omitted ; and the next day he took 60 grains of the kali sulphuratum, given in 10 grain doses. He was directed to have two small blisters applied to the region of the kidneys. The opium at night to be continued, with an occasional aperient, and to wear a flannel shirt next his skin constantly. The regimen of animal food, &c. to be very strictly adhered to, and the quantity of liquid taken, as also his urine, carefully measured, and both it and the ægesta kept for inspection.

On the 4th January, 1798,

On visiting him again, I found the blisters had not been applied, but that he had taken the kali sulphuratum as directed ; his skin cool and moist ; pulse 79 ; says that he perspires much in the night time, and that his sleep is less disturbed ; the flushing of his face, œdematous swelling of his legs, and temporary headachs, have almost entirely left him, and he is gaining strength fast. One quart of his urine had been evaporated the day before, and the quantity of extract from it was about an ounce.

8th.

8th.

The smell and quantity of his urine little different from natural, and the quantity of the extract much the same as on the 4th. The kali sulphuratum had been omitted; and though he has taken but very little of any hepatic or narcotic medicines, his progress towards recovery has been very rapid since the plan commenced; and the diminution of the quantity of the residuum singular in so short a time.

16th.

Found him not so well as I expected, the plan of cure having been deranged, and retarded considerably, by the unfortunate circumstance of his brother-in-law (on the 11th) losing his leg, by an accident in a coal-pit; his dependence being entirely upon him, he could not now get proper and regular diet. Mr. Burnet had also rather prematurely substituted a strong aromatic tincture, which I found him taking, and which might probably, with other circumstances, have tended to disorder his bowels, as he said he had a tendency to diarrhoea for some days past. I proposed his taking an emetic and omitting the tincture; but the emetic was not given him. The evaporation of his urine had also been neglected.

28th.

28th.

He was much better, and the diarrhoea had ceased. The progress towards recovery is by no means so rapid as for some time prior to the 11th, though he appears to gain ground ; his skin moist ; appetite and thirst moderate. One quart of his urine, on evaporation, yielded about an ounce of the extract as before. He was under great oppression of spirits, and unhappy from considering himself an incumbrance to his brother-in-law's family. Said he thought himself sufficiently recovered to work for his bread any where but in the pits, and would seek employment ; and as I saw this was likely to frustrate the hopes of a complete cure, I proposed taking him into the Artillery Hospital at Tyne-mouth, where he could have been very well accommodated in a room with the Hospital Steward ; and assured him I would maintain him, and I hoped, complete his cure, without any additional expence whatever to himself or friends. The lad himself anxiously wished to embrace the proposal, but it was otherwise opposed ; and on my calling again on the 24th February, I was informed, that he had gone to work in the mine again ; but after a few days trial, finding his strength inadequate, and the disease gradually returning, he went to Burtley, near Chester le Street, about 18 miles from this, where he hoped to meet with easy employment ;

ment; and I have not had an opportunity of seeing him since.

I think, from the great progress towards a cure, considering the time, there is no doubt but had the plan been followed up under more favourable circumstances, it would have terminated successfully.

It was my intention to have been guided entirely by the new theory of this disease, and to adhere strictly to the plan suggested by you; but I could not get the gentleman who attended him, to abide entirely by it; and as Nixon had little assistance from medicine, the rapid progress at one time towards a cure, is therefore principally to be attributed to regimen, and the advantage of originally a good constitution.

Previous to the attack of this disease, he had been a very healthy young man, without scrofula or other complaint, and accustomed always to the plainest and simplest food.

The pain in the region of the kidneys ceasing soon after commencing the treatment, renders it probable they were not morbidly affected; and the sympathy or connection between the stomach and skin, in his disease, from the beginning, was remarkable.

Tynemouth,

Tynemouth, 1st July, 1798.

ON riding past Benton yesterday, I enquired after Nixon, and found he had returned, and been employed in the colliery there as a pit-man, about nine days. His strength and appearance were greatly improved. He says, the only remains of his complaint, are some degree of weakness, and lassitude, particularly after working; he also makes rather more urine than when in his former health, which in quality is apparently natural. The œdematous swellings of his legs, thirst, and other bad symptoms, have disappeared. On the whole, I consider him a successful instance of what the regimen suggested by the new theory of the disease can effect, even with little other assistance, when the constitution is originally good, and the habits of the patient not previously vitiated.

From MR. SHIRREFF, Deptford.

February 23d, 1798.

A YOUNG LADY, who has lately completed her 12th year, of a thin habit of body, tall of her age, of a docile disposition, and who has a regular flow of spirits, subject, however, to sick headaches, and accustomed to eat much fruit, sweetmeats and pickles, has become affected with

Diabetes.

Diabetes. The months of June, July, August, and September, 1797, were passed in Devonshire, near the sea-coast, where she bathed in the sea, and used exercise on horseback. She returned to this neighbourhood early in October, with apparently an improved constitution. About the latter end of November she had an attack of angina; the left tonsil became enlarged, as well as the sub-maxillary and other glands of the same side. The angina went off; but such a state of glands remained as indicated a scrophulous constitution. After the indisposition, she did not recover her usual appearance of health; the wings of the nostrils became enlarged, the upper lip tumified, and the inside of the left nostril red, and excoriated; she had also slight herpetic eruptions. Early in the month of January her spirits became depressed, her disposition indolent, and equally indifferent to study and amusement. She complained of headaches and slight cholics; she became thinner, though her appetite remained unimpaired. About the middle of February, she had an intense thirst, and frequent calls to void urine. These were attributed to an improper habit; and she was restrained from the former, as the latter was supposed to be the consequence. The restraint, however, was impracticable.

At this time I was made acquainted with the circumstances. I desired the urine to be preserved;

served ; and on examination, it was evidently characteristic of the Diabetes Mellitus. I sent a portion of it, with an account of the case, to Dr. Rollo (it furnished the purest saccharine extract he had met with, and which granulated by keeping). I directed a diet, consisting chiefly of animal substances; an opiate combined with an antimonial at bed-time; the extremities to be anointed with a liniment of hog's-lard and camphor.

February 24th.

Her thirst was great ; her appetite was keen ; she had frequent headaches ; a costive habit of body ; a bitter taste in her mouth, with frequent nausea ; her nights were good, but when obliged to get up to void her urine, which was frequent, her skin was cool ; no rigors, or local affection in the kidneys ; the abdomen was not enlarged, but there was an evident hardness above the pubis, embracing the region of the bladder ; her skin, however, put on an appearance which requires a little more attention.

Upon her arrival from the sea-coast, I have observed she was much improved in her looks, as well as in general health, which was no where more conspicuous than in the appearance of the surface of the skin. Being subject to herpetic eruptions, I was accustomed to remark the singular dryness upon the surface, and particular feel, which seemed

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inconsistent

inconsistent with health; but after her arrival from sea-bathing; these singularities had disappeared, and the skin of her arms and neck had a natural look; but now appearances were worse than before, and such as struck me forcibly: the skin was dry, harsh, void of elasticity, shrunk, of a leaden hue, and seemed to adhere to the muscles; one would have supposed that there was no cellular membrane, being not only void of fat, but the motion of the skin was also trifling; in a word it seemed to be what is called hide bound.

An emetic was directed in the evening, and the body was to be rubbed with the liniment, to which had been added a solution of the sulphuret of potash.

25th.

The urine is of a deeper colour, and less sweet; an abstinence from liquids was recommended, so far as it was practicable. With my patient I called on Dr. Rollo; we agreed on the plan of treatment, which was to consist of an entire use of the animal diet; as drink, a dilute solution of the sulphurated potash in water, and two grains of the extract of hemlock, with one grain of the antimonial powder at bed-time.

26th.

Yesterday she ate voraciously at dinner; was put into the warm bath in the evening, and the skin afterwards anointed with a preparation of
hog's

hog's lard and pure ammonia. She had a good night, and without any occasion to void urine. This morning the urine is high coloured, and saltish to the taste ; indeed it might be considered as natural urine.

27th.

I was informed that the urine voided yesterday at one o'clock was free from sweetness, and perfectly insipid ; some time after it appeared natural ; but two hours after dinner was sweet, and in the evening again apparently natural. She was directed castor oil, being costive : the bath and inunction to be continued, and likewise the diet.

28th.

Has had a good night ; the urine this morning is evidently urinous, though of a pale colour ; her thirst diminishes, and her appetite is less keen ; the skin feels softer. Yesterday she ate bread at breakfast, which I was informed of immediately afterwards in paying my morning visit. I was determined not to lose this opportunity of watching through the day any changes in the urine. That which was voided until dinner time, was sensibly sweet. I evaporated three pints of it, and it yielded of a saccharine extract a quantity amounting to 8 ounces 3 drachms. Her dinner was entirely animal food, and what she passed afterwards deposited

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a lateritious

a lateritious sediment, and in colour, smell, and taste, differed very little from natural urine.

March 1st.

She had a good night; the thirst diminished; urine more natural in appearance. She continues the regimen, &c. and is ordered to try small doses of the powder of ipecacuanha.

3^d.

The urine differs little, either apparently in quality or quantity, from what is natural. Allowed her boiled milk and bread for breakfast this morning. At 11 o'clock this forenoon, the urine not sweet. She is to be indulged with a biscuit at dinner, and another at tea in the afternoon. The urine was examined at bed-time, and it was found very sweet.

4th.

The urine voided in the night was insipid, this morning saltish. Visited Dr. Rollo with my patient. Continuance of the animal food recommended, and occasionally a trial to be made with a small quantity of bread.

6th.

Urine very sweet; complains of thirst and headaches. I suspected she had been deviating, which
was

was acknowledged ; she promises a more steady adherence.

9th.

She is able to take three biscuits in the 24 hours, without the production of sweet urine ; but if this quantity is exceeded, the saccharine matter is perceptible. Therefore the assimilating powers are now able to convert a certain proportion of bread with animal food into proper chyle, which is capable of being applied to the purposes of nutrition.

10th.

The appearance of the skin is much altered for the better. Medicines and diet to be continued. The weight of the body was this day found to be 64 pounds.

15th.

Nothing particular has occurred these five days past. She has been cautiously increasing and diminishing the quantity of biscuit, according to the effects produced ; the number of biscuits has not exceeded three or four, and the fourth generally produces sweet urine.

23d.

From the 15th to this day nothing material has happened. The urine voided in the interval of her meals is insipid, and is falter and more urinous the farther distant from the meal. On the night of

the 22d the body was covered with a general moisture.

24th.

This morning the weight of the body was found to have increased, since the 10th, five pounds and upwards.

28th.

This day I have augmented the quantity of biscuit. The patient's health now improves daily.

29th.

The additional quantity of biscuit has reproduced the sweet urine, though in a less degree. The number of biscuits to be diminished.

April 9th.

During the holidays there has been a great deviation from the plan. On Good Friday she eat sweetened bread ; on the Sunday following, sweet cakes and sweetmeats. These were repeated yesterday, with sugar to her tea. In the evening she voided 7 ounces of urine, highly saturated with sugar. The above irregularities were carefully concealed ; but thirst, headach, and sweet urine, betrayed the deviation. Being alarmed at such a relapse, she promises more steadiness in future,

12th.

The urine natural. She takes the biscuit.

May

May 4th.

The whole plan now consists in regulating the quantity of bread ; when a large proportion is used, sweet urine is still reproduced, and of the saccharine matter she is sensible, by the peculiar feel of uneasiness about the meatus urinarius. The skin is very soft, and appears different from what it did at the commencement of the disease, and for a long time afterwards ; her appetite is good, but not particularly keen ; she is not troubled with thirst ; her sleep is undisturbed ; no head ach, nor any local pains about the kidneys—the tension of the region of the bladder is removed ; her spirits are good ; her strength returns, and she practises her juvenile studies with alacrity ; the disposition, however, to the disease is not yet removed.

6th.

After having returned to the diet she has been accustomed to, before her illness, sweet urine was again reproduced, and which I apprehended before its examination, from the change in the appearance of the skin, of the neck, and arms.

16th.

Since the 6th, her diet has been very strictly attended to, and the injunctions particularly so ; the urine is not sweet.

31st.

Since the 16th, our patient has been progressively increasing the quantity of biscuits and farinaceous substances; she can with impunity this day consume six biscuits, and the whole produce is disposed of by the assimilating powers. The urine is natural, but on Tuesday the same quantity of bread produced six ounces of water, highly saturated with sugar. The bulk of the body is increased; she is active and capable of using exercise without fatigue.

I still persevere in the use of frictions, and anointing the body; the cold bath is recommended, and will be used, for the first time, on Monday next. She has been for some time using bitter and chalybeate medicines.

June 3d.

The patient eat some green pease without producing sweet urine. The skin looked florid, the muscles strongly marked, and such a general appearance of health as had not before been observed for many months. The bread was this day diminished, lest the usual quantity added to the pease might be more than could be disposed of.

4th.

Evaporated some of the urine; less animal substance in it than what has hitherto been observed.

No

No sweetness in her urine, which in flavour and colour does not differ from what is natural.

6th.

Quantity of bread considerably increased without any inconvenience occurring. Medicines, frictions, and inunctions continued; moderate exercise is recommended and used.

Formidable as the Diabetes Mellitus has been hitherto found, it can now be moulded to the wish of the practitioner. To remove the disposition to the disease may be difficult, but an important advantage is gained, as we now can cure the unpleasant and most distressing symptoms, and bring the disease into a mild state, which may ultimately be eradicated by regimen and medicines. What may be the extent of time before my patient can get free from the disposition, it may be impossible to ascertain; I have no doubt, however, of its accomplishment, though it may remain until after those changes in the system have taken place, which are brought about at the age of puberty. While the case continues under my charge, every attention shall be bestowed, and the event shall be communicated to you.

In the management of this curious disease many reflections on its nature have arisen, but as these have led me to adopt your opinions generally on the subject, I shall for the present reserve them.

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In the mean time it gives me some satisfaction to have contributed my share, so far as one case extends, towards elucidating some points in the history and progress of the disease, especially in the changes the urine undergoes at different times after eating, and according to the substances eaten.

From MR. HOUSTON, Brewer Street, London.

L———, aged about 30, fair complexion, light hair, and naturally of an extremely irritable constitution, in the month of February, 1793, received a violent shock by the death of one of her parents. On this melancholy occasion her grief was so very poignant, and at times so frantic, that serious apprehensions were entertained of a total derangement of intellect, and in this state she continued several weeks.

During the parents' illness, she by too much fatigue, watchfulness, and too little attention to herself, contracted a cold; this was soon followed by a cough which gradually increased. The means of cure consisted in drinking asses' milk, and riding behind a man on horseback, when the weather permitted, and her strength enabled her. She was blooded in the arm, and blistered on the breast; took paregoric elixir and syrup of poppies to allay the cough, but with little or no effect. The perturbation

turbation of her spirits, the want of nourishment and sleep, a constant fever, and almost incessant cough had worn her down to a skeleton, and weakened her to that degree, that she was scarcely able to walk across the room. In this state she continued to the latter end of May, when she set out for Bristol Wells. At the end of the first stage (Hounslow), she was so exhausted that she fainted, and it was proposed that she should return to town, without going any farther ; but when she had recovered, and rested a while, she determined to pursue her journey, which she performed better than could have been expected, considering her outset. Drinking the waters, riding on horseback, and a strict adherence to the regulations of the place, soon brought on an amendment at the Wells, and in the end of October she returned to London apparently in perfect health. But she no sooner arrived and entered the house than a renewal of her sorrows were brought on, and though not to quite so extravagant a pitch as before, yet to such a degree, that her friends were alarmed, and a change of situation was advised, in order to divert her mind and detach her thoughts from the recollection of former scenes of affliction. Before a suitable situation, or house however could be found, the season was too far advanced, and become withal so extremely inclement and rigorous, as to render a removal hazardous. She remained, therefore, in the old house, and her mind
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by degrees became more composed. In this state she continued with no apparent complaints except a few slight colds, and some attacks of cardialgia, or what she called acid risings in her stomach, till the latter end of July; when she took a journey of about 400 miles, to visit some relations, and returned in the latter end of October, to all appearance in good health and spirits.

The state of her surviving parent's health did not admit of their making any excursion during the whole of the year 1795, or till the latter end of August 1796; during which time her affection for, and attention to, her parent, who was almost constantly confined, was so great, that she was seldom or ever absent from him; so that she might be truly said to have led an anxious and sedentary life; yet she enjoyed tolerable good health, excepting some slight attacks of common colds, sore throat, and cardialgia, which were not of long duration; and though some of her friends observed that she did not look so full or well in the face as formerly, she was not herself sensible of any diminution of flesh in any other parts of her body.

More with a view of benefiting her parent's health than her own, which, indeed, did not seem so much in need of it, they set out about the 20th of August for Bristol Wells. It has been already mentioned, that it was observed she had fallen off in looks; and a few days before her departure, having

having dined at a friend's, some of the company remarked that she looked exceedingly ill ; but this could readily be accounted for, from her having on that day undergone great fatigue, in accompanying her parent (as she did on all occasions) in transacting business, at different and distant parts of the town, preparatory to their leaving it. On the road she found her stomach much disordered with hot, and sour eructations, or belchings, which she attributed to the malt liquors at the inns ; and on her arrival at the Wells, finding her throat sore, sent for a gargle from the apothecary they had formerly employed ; the next morning she began to drink the water, and persevered in drinking it for six weeks, in which time she hardly had any other complaints than a few slight head-achs. On their quitting the Wells, they, on their way home, stopped at Bath ; and as her parent received benefit from the use of the waters of that place, they remained there eight weeks ; but before the expiration of the first fortnight, she found her stomach again disordered with heat and acidity, which in a short time increased to a height almost intolerable ; the fauces were so sore, that it was a pain to swallow any thing ; and her tongue was equally so, being covered with a crust, or hardened slough on the top, and blisters round the edge. Her thirst was insatiable ; to quench which, she ate a great quantity of fruit, and drank profusely of
Seltzer

Seltzer water and hock, but to no purpose. Her skin was so parched, that the pores did not seem to emit the least moisture. To remedy this evil, some doses of James's powders were given, but to no effect; towards the close of her time at Bath, she drank the waters for about a fortnight, they were supposed, however, to do more harm than good; and growing daily worse there, she set out for London, where she arrived the 4th December, 1796. She immediately sent for her apothecary, who was greatly shocked; as to all outward appearance, she seemed to be in the last stage of a consumption. Her pulse was exceedingly quick, but so feeble, that he could scarcely feel it, and so tremulous, that he could not with any certainty count or distinguish the strokes. For two days, he gave her every six hours a draught with kali ppt. magnes. alb. āā ʒi, taken with half an ounce of lemon juice in the state of effervescence; they agreed with her, and, as she thought, cooled her; she had no cough, but for some time back had lost her appetite, the stomach rejecting almost all solids; and when it did receive any, they generally laid heavy on it, or disagreed; as some nourishment, however, was necessary, she was advised to eat eggs raw, or done very soft; as also oysters and other shell-fish, as having a tendency to correct acidity. On the 3d day after her arrival in town (Dec. 6th) an eminent physician was sent for, who ordered a blister to be applied

applied to her breast; magnes. alb. gr. xv. in a draught every eight hours. These she took till the 15th, when she was ordered a draught with myrrh pulv. gr. xij. ferr. vitriol gr. iij. kali ppt. gr. viij. three times a day. This course she continued, with some trifling variations, but little interruption, till about the 19th February, 1797. By this time those medicines had the effect of greatly recovering her appetite, and she had been allowed to eat such light animal food as she fancied; but from this indulgence, of which she availed herself, with the return of her night's rest, which by this time she began to enjoy, she derived no other advantage than a small acquisition of strength; for there was not the least appearance of bodily nurture, or any abatement of heat and acidity. Her draughts were now (19th February) changed to others, with magnesia calcinal. \mathfrak{z} ss. and sp. ammon. comp. \mathfrak{z} i. to be taken three times a day. These were continued to the 1st of March, when \mathfrak{z} i. of tinct. columb. was added, and half the sp. ammon. left out. But as the quantity of magnesia was found to purge too much, it was sometimes necessary to substitute the test. ostreor. The physician having compared the tardy, if any progress in amendment, with the quantity of food she was able to take, (for her appetite was greater than before her illness) began to discover symptoms of diabetes, and therefore gave orders to measure the quantity of
fluids

fluids drank, and the quantity of urine she made, and finding the latter exceed the former, he had some of it evaporated, and found it to contain a considerable portion of saccharine matter ; upon which she was advised to eat less vegetables and more animal food. On the 15th March, the tinct. columb. was omitted. On the 18th, a gentle opening draught was given, though she usually took magnesia when any thing of the kind was necessary. On the 20th March, Dr. R. was consulted with her former physician ; and as he is already so well acquainted with all that has since been done, or happened, it is unnecessary for the writer of this to carry it any further.

Continuation, by the Author.

On the 20th March, 1797, I visited the patient, with her physician and apothecary ; she complained of a burning sensation at her stomach, which she said was intolerable, with the sense of a sharp and hot acid rising into her throat ; her teeth were on edge, tongue red, and gums full ; she had little thirst, and was occasionally sensible of a moisture on the palms of her hands, and on other parts of her body ; her appetite was keen, and she never felt satisfied, but said that this degree of appetite had only been lately remarkable ; and she complained much of a
burning

burning sensation in her stomach, and of great acidity; she was extremely emaciated, feeble, and inactive; her skin dry, and rather warm; pulse about 88; her urine of a pale colour, but to the taste scarcely sweet; the quantity could not be distinctly ascertained; it did not seem, however, to have been so increased as to engage any particular notice; a little of the urine was evaporated; the residuum resembled treacle, but was salt to the taste, and the extractive matter did not seem much to exceed the quantity in healthy urine. On the whole, the adoption of light animal food, with less vegetable matter, and the medicines, had mitigated the disease. The physician who attended had a copy of the notes of Captain Meredith's case the preceding January, and he now very readily agreed to the animal diet entirely. The testaceous draughts were to be continued, with the occasional use of magnesia; to keep the bowels open, an emetic was to be given in the evening.

On the 14th April I saw the patient, with the physician and apothecary; her looks had more the appearance of returning health; she moved about with more agility and strength, though she complained of not gaining flesh; her appetite is now good; the tongue is clean, but not so florid; she has no thirst; the urine does not exceed a quart, a small portion of which being evaporated, the residuum was quite saline, and urinous in smell,

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but it was not evaporated so much as to determine the tenacity. The burning sensation in her stomach is diminished, and there is less acidity; however, another emetic is prescribed, and the matter thrown up is to be examined, in order to ascertain whether it possesses acid properties. The patient informed me to-day, that for several years she has indulged in fruit, pickles, and sweetmeats.

April 25th.

The emetic ordered on the 14th brought up very acid matter, which was found by the apothecary to effervesce with an alkali; the urine deposits a reddish sediment; she has less uneasiness at the stomach, has more strength, and a more natural appetite; her skin is moister. She is desired to take calcined soda, in the form of pills; and the draughts, with three or four drops of the hepatized ammonia; castor oil when necessary; the opiate, with an antimonial, at bed-time; and every other night the warm bath.

May 10th.

Very little change. Asafoetida is added to the pills, with calcined soda, and the quantity of the hepatized ammonia increased. From the delicacy of circumstances, an accurate enquiry cannot be made; deviation of diet may happen; in this case, we can only hope for a certain compliance with
regimen,

regimen, and a certain information with regard to appearances, and ultimately a recovery with tardy and irregular advances ; it merits much attention however, even with the view of discovering points of importance in the treatment, under the most unfavourable progress.

June 8th.

Very sensible of an increase of strength, and that health is returning, the urine continues in a natural state, at least there is no saccharine matter. The heat of the stomach is much diminished ; the appetite feels natural ; no thirst or hectic symptoms ; she has discontinued our medicines, and only takes Schweppe's acidulous soda water, which she likes, and says it has been of much service in relieving the uneasiness of her stomach. To be allowed about four ounces of bread in the day.

16th.

Since the use of the bread, the disease has been re-produced ; the urine is clear, and of a sensibly sweetish taste ; 18 ounces yielded a saccharine residuum of 1 ounce and 5 drachms ; her skin is again hot and dry ; the pulse quicker, thirst intense, appetite keen, tongue florid and red ; also the heat of the stomach extremely unpleasant.

She promises to return to the entire use of animal food ; her antimonial opiate to be taken at

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night ;

night; Schweppe's water for drink; and a blister to be applied to the region of the stomach.

22d.

The urine, in smell and taste urinous, having become so in twenty-four hours after leaving off the bread; her appetite is not so keen; the tongue is not more florid than common, and the uneasy hot sensation of the stomach is much less, though occasionally troublesome; the thirst is gone; the blister relieved the stomach; the regimen, with Schweppe's water, to be continued.

July 14th.

In a state of apparent recovery; she occasionally takes a biscuit or two, but perseveres in the diet generally, and Schweppe's soda water. Next week she goes to Bristol, where she is to observe the same conduct, being fully sensible of the influence of a change of diet, and equally so, that every thing depends on her own steadiness.

No accurate account could be obtained with regard to the quantity of urine; in general terms it was said that it corresponded with the quantity of drink.

February 5th, 1798.

Returned a few days ago from Bristol and Bath; at the latter place she bathed in the warm bath, and was relieved, by its being followed by a moist skin.

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The Bristol water was very grateful to her stomach, and generally superseded the use of Schweppe's soda water.

She appears much in the same state as when I saw her in July; the disposition to the disease still remains, and she feels better or worse according to her diet; she eats daily some biscuit, and has done so generally all the time she has been away; the acidity of her stomach still continues a distressing symptom; the urine yields a saccharine extract.

March 6th.

Since the first, has been strictly on animal diet; the several symptoms are removed, and she appears altogether better than I have yet seen her.

15th.

The urine is light coloured, but in taste and smell urinous, though not strongly so; on evaporation, it yielded a dark coloured residuum, of an offensive smell, pungently saline in taste, but had some tenacity, the quantity not apparently greater than from healthy urine.

21st.

Continues better, perseveres in the diet. On the 17th she ate a sweet cake, which was soon vomited, in a four state.

April 2d.

She assures me no change in the diet has yet been made; she begins to loath food, but believes it is only animal food, as she feels a strong desire for vegetables; and alledges that, even under the animal food, she has had the acid state of her stomach, especially at times when her mind has been uneasy; tongue less red, indeed it is rather pallid; the urine smells strongly, and has a greasy scum; on evaporation, it yielded a saline and bitterish tasted residuum, without tenacity; and when treated with nitrous acid, furnished scales. She was allowed a small quantity of brocoli, spinage, or sallad, without sauce.

16th.

In all respects better, and for these eight days has been eating brocoli and sallad occasionally, without any re-production of the disease.

24th.

A portion of urine was examined, which was found clear, but of a urinous taste and smell; its residuum, however, yielded oxalic acid when treated with the nitrous acid.

May 5th.

It was ascertained that she had eaten some biscuit between the 16th and 24th April.]

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Her skin is moist ; pulse 72, and regular ; her appetite less keen, and she feels more uneasiness after eating, or rather has a sense of indigestion ; tongue clear, but not florid ; she has gained flesh. She promises to leave off bread, and to take only cauliflower and spinage. The salad does not agree with her ; she assures me, and so does her maid, that the other day, after eating more vegetables than usual, the urine smelt and tasted sour immediately after it was voided. She is directed an infusion of quassia, with the addition of the compound tincture of gentian and chamomile.

10th.

Is again to visit Bath and Bristol ; she promises an adherence to the plan, though she acknowledges that her resolution is often likely to fail her ; she will, however, be as steady as she can, being perfectly persuaded she has no other prospect of recovery but by so doing. She has again been sensible of the acid smell and taste in the urine, after vegetables. I examined her urine to-day, but it did not smell or taste of any thing, except the urinous flavour and impression.

THIS CASE, though not as yet completely terminated, appears to me of so much importance, that I have inserted it in its present progress. There can be little doubt, that the adherence which has been bestowed on the animal diet since the 20th March,

1797, has not only prolonged life, but given strong hopes of the re-establishment of as great a degree of health, as can possibly be expected, under a long continued stomach complaint.

The exact period when Diabetes Mellitus was actually formed cannot be determined: it was probably when the keenness of the appetite took place, but when that happened cannot be accurately ascertained. She had been long subject to stomach complaints, and the keenness of the appetite is only noticed in the account about the 1st March, 1797, whereas the cardialgia is mentioned as long before as May, 1796; and before these periods the health was much impaired. These complaints had been partly brought on by the circumstances so well related by Mr. Houston, and partly by the frequent use of fruit, pickles, &c.

The animal diet, though not unremittingly persisted in, yet by a more steady use of it in March and the beginning of April, the disease was so far overcome, that the urine became as near as possible to the standard of health. It is to be regretted that a further perseverance did not at that time follow; however, the progress shews, that certain vegetables, such as brocoli, spinage, sallad, &c. may be eaten at a proper time of the treatment, without re-producing the disease, while bread could not be eaten with impunity. This fact we consider of much advantage, as it enables us to guard against
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the effects of a long continued use of animal diet, and at the same time gratify, in some measure, our longing patient ; we say in some measure, because even these vegetables do not long check the ardent desire for bread ; indeed, the stomach appears very whimsical, for when it obtains its desires, other things are soon solicited.

The circumstance of the urine having become acid after the use of more than the usual quantity of vegetables, is a curious fact, but as it merely rests on the testimony of taste and smell, we do not hold it, in this case, as satisfactorily ascertained ; it deserves, however, to be kept in view.

From DOCTOR PEARSON, Physician to St. George's Hospital, Lecturer on the Practice of Physic and Chemistry, &c. London.

CASE I.

H. LAURIE, aged thirty-eight years, a cabinet-maker, became my patient, July 21, 1791. He had been ill three years, according to his own account ; but from the nature of the symptoms first observed, it seemed probable that he had been disordered for a longer time. The first symptoms observed were an unusual quantity of urine, loss of flesh, and sickly countenance. He became gradually more emaciated, and the increased discharge of urine was permanent. He had not attended to the taste of this
excretion

excretion till eighteen months since, when he found it to be sweet. Half a year ago the legs grew œdematous. Formerly he used to sweat very freely, but of late that discharge had apparently ceased. He had had a gleet for some months.

The patient, who had in health been a lusty man, was now exceedingly thin; he was in a debilitated state, and passed about nine pints of sweet urine every 24 hours, although there was a great variation in the quantity of drink. He thought the quantity of urine was varied little by increasing or decreasing the quantity of drink; nay, he even said the discharge was lessened by increasing it. The appetite for food was, at least, as great in health as it had ever been during the whole course of the disorder. The mouth had felt parched, and thirst had subsisted during great part of the illness.

The patient lived abstemiously when in health, but during his disorder he generally drank from two to three pints of porter daily.

It would afford no instruction to give a minute detail of all the medicines prescribed, the greater part of them being those sanctioned by experience, although I believe they have rarely, I had almost said *never*, proved really efficacious. It may be of use to mention some medicines which were employed, of which we had before no experience, although they did not appear to be of any service. Of this description were the following.

Thirty

Thirty grains of carbonate of soda were taken thrice every day for ten days.

Twenty to thirty drops of oil of turpentine were given three times a day for a month, during which time the urine had the smell of this substance.

Two grains of calomel were administered daily for two months, without affecting the mouth, stomach, bowels, or urinary discharge.

Blistering plasters were applied repeatedly to the loins; and a discharge was also kept up by means of them for some time.

It may be proper also to notice the extraordinary, and almost incredible inexcitability of the stomach to antimonials, and the same condition of the intestines, although I do not know that this state had any connection with the diabetic complaint. At first, thirty grains of pulvis antimonialis, or James's powder, were given as a vomit, but they produced neither vomiting nor sickness. Forty grains of this medicine were next given in an evening; he slept as well as usual, and no sensible effects ensued till the following morning, when both vomiting and purging came on, by which the stomach, which had been disordered, was much relieved.

Thirty grains of pulvis antimonialis were administered some time after the former doses; and next forty grains, at four different times, without any sensible effects from any of these doses; excepting
once

once vomiting; but that not without the aid of warm water, containing common salt. He took forty grains of this medicine one evening at eight o'clock, a second similar dose at nine o'clock, and a third similar dose at ten o'clock, without any perceivable operation till one in the morning, when he grew sick, and afterwards vomited once only.

At another time, forty grains of this antimonial preparation were given, and in one and a half hour farther, sixty grains, upon which he vomited a little. And on another occasion the patient took in three hours, one evening, six doses of the antimonial powder, of sixty grains in each, and soon after the last dose he vomited about a quart of liquid, his stomach grew easy, and he could have eat at supper as usual; he passed a quiet night, and discharged during it even less urine than usual; the next morning ate at breakfast with a good appetite; and during the day purged a good deal without griping. One evening he also took six doses of antimonial powder, of thirty grains each, in six hours successively, without any sensible effect till next morning, when he was a little sick, but vomited only once, although he drank warm water; and ate at breakfast with his usual good appetite. Nor was the stomach inexcitable to antimonial powder only; it appeared that ipecacuanha, in the quantity of a tea spoonful, seldom occasioned vomiting. It also appeared that he could not be purged with
less

less than three ounces of sulphate of soda. It may be proper to notice that there was no room for doubt as to the virtue of the pulvis antimonialis employed, because this medicine, from the same parcel, operated on other patients in the usual ways.

The patient discharged sweet urine, in the quantity of about eight to ten pints every twenty-four hours; grew more and more emaciated, and weaker; but the anasarcaous swellings disappeared, and the appetite for food continued extremely good, with constant thirst, to November, 1792, when he omitted to call upon me, and I heard nothing concerning him till May following, when his wife acquainted me with his death. She informed me that he continued to discharge sweet urine, and that at length his appetite failed; that he sweated much at times, and two days before his death he grew sick, and vomited; became insensible, and died in a most emaciated state.

DISSECTION.

Mr. EDWARD FORD examined the body with great care. I was present on this occasion, as well as two of my pupils, Mr. Warren and Mr. Hutchison. The kidneys were found to be in a perfectly sound state, and so were the ureters; but the urinary bladder was much thickened, and the urethra

thra was dilated to three or four times its usual width. The urine found in the bladder did not taste sweet; but how long before death it ceased to be sweet had not been observed.

All the viscera of the thorax were in a perfectly found state; and so were those of the abdomen, excepting the mesentery, which was very much thickened, although the glands of it were not at all diseased.

Remarks.

1. In the above case, the Diabetes, attended with saccharine urine, appears to have subsisted more than four years, and then proved fatal.

2. During this time, a great quantity of nutritious matter, namely, of sugar, and probably other kinds of assimilable matter, was daily discharged with the urine.

3. During the whole course of the disease, except in the last stage of it, the appetite for food was considerable, ordinarily greater than in health, as well as the thirst; and there was a gradual and constant waste of the flesh.

4. Accordingly, more nutritious matter appears to have been carried off by the urinary passages than was in proportion to the daily waste of the animal œconomy in health; or a smaller proportion

tion was assimilated than in health; wherefore, the emaciation gradually increased to such a degree, as to produce fatal debility.

5. In the last stage of the disease the appetite failed, and the urine ceased to be sweet; and then, probably, not more food was taken than was assimilated, although that was a smaller quantity of food than in health. Sufficient attention, however, was not paid to the quantity of urine in the last stage, nor do we know whether or not it contained assimilable matter of a different kind from sugar.

6. Whether the diseased state of the mesentery ought to be considered as having any share in occasioning the Diabetes, must be determined by future observations, in which attention should be paid to the state of this part.

7. As to the indisposition of the stomach and bowels to be affected by antimonial medicines, ipecacuanha, and sulphate of soda, as well as, perhaps, purgative salts of every kind, this state, perhaps, was not connected with the diabetic complaint, but must be referred to the patient's peculiarity of constitution.

CASE II.

The following Case is transcribed from my Register of Cases, which I kept when I was a Pupil at St. Thomas's Hospital. The Patient was under the care of my late friend, Dr. RICHARD HUCK SAUNDERS.

N. CRISP, a shoemaker, from Beccles, aged 25 years, was admitted into the hospital on the 20th March. He had only noticed his disorder fifteen months; which he observed to begin with thirst, and a discharge of an extraordinary quantity of violet smelling and sweet tasting urine. He had always lived temperately, and no cause could be assigned for his illness.

For the first six weeks he passed about six or seven wine pints of urine every twenty-four hours; the month following it increased to double of this quantity, that is, to twelve pints in a natural day; in six months he passed about twenty pints every twenty-four hours; and, according to the patient's account, the quantity excreted after this time, in six weeks, was even thirty wine pints every twenty-four hours, for two months; at the end of this time the urine decreased to twenty pints in a natural day, and soon after to sixteen pints; which quantity he continued to excrete the whole
time

time he was in the hospital. The urine was uniformly sweet. His drink was sage-tea, barley-water, beer, milk, and water; it was estimated to be nearly equal to the quantity of urine. He was a good deal reduced in point of flesh. The gums appeared to have been absorbed, or worn away, and several of his teeth had grown loose, and been taken out.

During the last five months, a cataract had taken place in both eyes. I do not relate the treatment, because I send you the account of it in Dr. HUCK SAUNDERS's own writing, which he was so kind as to transcribe for me from his Hospital Case Book, the patient having been under his care for some time before I attended.

The urine, I have said, was constantly sweet, and in warm weather I observed that it evidently began to undergo the vinous fermentation. He sweat profusely during the Summer. The pulse varied between 70 and 108. The appetite during the whole illness had been at least as great as in health, and while he was in the hospital it was voracious. He was treated in the hospital for five months without receiving any benefit, and then he was discharged, but less emaciated and reduced in strength than might have been expected.

DOCTOR HUCK SAUNDERS'S *Account.*

On the 20th March he was ordered a milk diet, half a drachm of rhubarb twice a week, which was continued to the 6th of June. He was at the same time ordered dec. cort. Peruv. \mathfrak{z} ij. cum tinct. cort. Peruv. simpl. \mathfrak{z} j. sextis horis; to each dose of which was added (16th May) ten grains of alum. This prescription was continued to the 6th of June, without any very remarkable effect, only his strength was increased, *his appetite was good, but his thirst did not decrease.* On the 18th of May he complained of a cough, with a thin defluxion on his chest, for which he took the lohoc cum olibano, till the 9th of May, when he had no further occasion for it. His urine was still about ten quarts in a natural day. The mel rosac. cum tinct. myrrh. was ordered on the 9th of May for the erosion of his gums, and left off about the 6th of June, when that symptom was pretty well removed. On the 6th of June he began to take thirty drops of tinct. cantharid. bis die, and had increased the dose to one hundred by the 13th. From this day to the 11th of July he took one hundred drops thrice a day; and from the 11th of July to the 1st of August, one hundred and twenty per diem. Besides this medicine, he took seri alumin. \mathfrak{z} iv. bis die the 4th July to 1st of August. His urine, which amounted to ten quarts

quarts daily on the 6th of June, was not more than eight on the 20th of June, and never came down lower whilst he remained in the hospital. On the 1st of August he began to take ten grains of the powder of galls thrice a day, which he did to the 15th, when he left the hospital, despairing of a cure, as he had met with so little relief in it. He continued, or was ordered to continue, the milk diet all the time.

Remarks.

1. We do not know the issue of this case, but it can scarce be doubted that it terminated fatally.

2. The progress of the emaciation was slower, although the quantity of sweet urine was greater, than in the former case.

3. As in the former case, the urine was constantly saccharine, and the appetite was greater than in health, although the patient kept losing flesh.

4. It does not appear that the urine was in greater quantity than the drink, nor that the discharge by the skin was lessened. As in the former case, no cause could be assigned for the disease.

5. Notwithstanding the long continued treatment directed by one of the most experienced, skilful, and attentive physicians in London, no

ground was gained ; on the contrary, the constitution grew more diseased. The various remedies employed you will find in this physician's own statement, and it is but justice to say,

———*Si pergamæ dextrâ
Defendi possent, etiam hac defensa fuissent.*

6. From the uniformity in the quantity of urine for so many weeks together, it does not seem probable that water was absorbed by the skin ; for in that case, we might expect it to vary according to the humidity or dryness of the air.

CASE III.

July, 1798.

A *Gentleman*, aged about 56 years, who had lived rather in a sedentary manner, was troubled for five successive winters with a cough, attended by a copious spitting. In the Summer he was almost free from these ailments. During the two last of these winters symptoms appeared, which, it was apprehended were those produced by pulmonary tubercles and vomicæ.

In the early part of the Summer succeeding the fifth Winter, namely, in May, 1797, when the patient was considered as labouring under the chronic

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nic kind of pulmonary phthisis, besides taking the usual medicines in such disorders, he began to breathe hydrocarbonate gas; which was administered to him by Dr. Thornton. Soon after the use of this medicine, he experienced a very decisive amendment of his pulmonary disorder; and continued almost entirely free from cough, spitting, and difficulty of breathing, the whole of the Summer; nor did these complaints return in October following, as they had constantly done for several preceding years.

In October last it was observed that, notwithstanding the amendment of the disorder of the chest, a gradual wasting of the flesh had taken place; so that instead of being, as in health, muscular, and rather corpulent, his body was become thin, and his limbs were emaciated. The appetite continued to be as great, and was frequently greater than in health. The pulse at the wrist was most commonly about 80 in a minute, and never exceeded that number. The tongue had a healthy appearance, and there was pretty constantly thirst. The patient had sweat profusely for the whole preceding year.

I now learnt that he had been accustomed, for five or six years past, to drink to the amount of from five to eight pints of liquids, such as tea, capillaire, small beer, wine, water, coffee, &c. in the space of every twenty-four hours. A

proportional quantity of urine was discharged; that is, as much urine, or thereabouts, as he had taken of drink. As will be expected, the night-rest was disturbed by rising to pass urine. The quantity of urine being at first attended to without reckoning the quantity of drink; and being perceived by the attendants to be sometimes sweet to the taste, the patient was pronounced to labour under the Diabetes. The urine also having been tasted by a person of unquestionable accuracy, it was discovered to be saccharine. A parcel which I examined was not decisively sweet, but I was struck with a smell which I had never perceived on any former occasion, namely, that of stale beer. Half a pint of this urine, on evaporation, yielded 400 grains of extract-like matter, which contained no sugar perceivable by the taste. Another parcel of the same urine, on standing ten days in a warm room, in a three pint bottle, which was half full, and closed with a glass stopper, became covered with a white scum, and a deposit took place of seemingly the same sort of matter; but the urine itself, which was quite clear, smelled strongly of vinegar, and tasted sourish. On distillation, this sour urine afforded three-fourths of an ounce of liquid acetous acid, of nearly the strength of weak distilled vinegar. It may be useful to notice that the patient had lived principally on animal food for several months,

months, and had drunk a pint of wine daily, instead of a larger quantity, as was his custom before his illness. During my attendance occasionally for three months, the urine generally had the beer smell, and on standing became sour. Two or three different times it had however, undoubtedly, the saccharine taste. Some parcels of this patient's urine, which had a fleshy and beerish smell, happening to stand in a close vessel, in a warm room, from November, 1797, to May following, not one of them had the usual smell of urine of persons in health, nor of putrid urine; but either smelled sourish, or musty; and they deposited lees, and were covered with white scum. The urine of the patient, however, sometimes smelt like ordinary urine; but on keeping it did not grow foetid, nor acquire an animal odour; nor did it ferment, and become sour. It was also found that this last mentioned sort of urine retained the usual acescency of urine of healthy persons, as betrayed by the test of turnsole, even after keeping in a warm room six months. In other properties, the urine of the patient agreed with that of people in health, namely, in depositing, during repose, crystals of uric * oxide, in containing super-phosphat of lime, phosphate of ammoniac, muriate of soda, &c.

* See Philos. Transf. for 1798, Part I. p. 15. A paper on urinary concretion.

The patient was directed to live four days entirely on vegetable food. The urine during this time proved so irritating to the urethra and glans penis, as to inflame them, and a little of it was even passed involuntarily. It was observed that the urine excreted during the use of this kind of food, contained none of the uric oxide, which is the usual basis of urinary concretions. According to my observation the urine voided, when the food was entirely animal matter, was equally acescent, and fermentable into vinegar, as when it was entirely vegetable matter.

The quantity of urine, in October and November last, never exceeded, according to estimation, the quantity of drink; and the quantity of urine seemed to vary proportionally, or nearly so, as the quantity of liquor varied.

Except some slight incidental colds, the patient was quite free from pulmonic complaints the whole of the last Winter, as well as during the present Summer. The thirst has abated a little; the appetite for food has been of late about the same as it was in health, instead of being greater than formerly. The pulse at the wrist has varied between 70 and 80 in a minute. The wasting of the flesh has scarce continued to go on of late, and the strength has decreased very little for several months past. The urine, however, does not appear to have diminished in quantity, nor to have
been

been altered in its properties, in proportion to the general amendment.

The amount of this excretion has been for some months, at least, five to six pints in the space of twenty-four hours. It still commonly has a beerish smell, and on standing in a warm room does not ordinarily smell urinous, and putrefy like common urine, but becomes acescent, and deposits lees, and throws up scum as malt liquor does, on growing sour. There is no room to suppose that the quantity of urine exceeds the quantity of drink.

The patient has continued to live almost entirely on animal food, even breakfasting usually on what is called *beef-tea*, in place of the vegetable matter commonly taken at this meal. When vegetable substances were occasionally taken as food, the urine was increased in quantity, but no effects were otherwise experienced different from those during the use of animal food. It was thought adviseable to continue, however, the animal food, as it agreed very well with the patient, and as the urine was less in quantity than when vegetable food was taken.

I think it quite useless to relate particularly the medicines which were prescribed for the entire cure of the diabetic tabes, because there appeared good reasons for distrusting their efficacy. I think it likewise unnecessary to relate, particularly, the medicines which were prescribed as palliatives, and
for

for incidental complaints; because, although they proved effectual, yet, as they were plainly indicated by the symptoms, I take for granted they must be known to every well informed practitioner.

Remarks.

As in the malady above described the urine was not in greater quantity than the drink; as it was not in so great quantity as is expected to be discharged in Diabetes; as it had seldom a sweet taste, I am aware the propriety of calling the present distemper Diabetes will not be acknowledged by many persons without hesitation. The considerations which induce me to conceive this to be an instance of that disorder are, 1st, the great appetite for food; the constant thirst for so long a time; the constantly unputrescible, sometimes saccharine urine, and which was frequently susceptible of the acetous fermentation; the quantity of urine being much more than that of most of healthy persons; and the gradual emaciation. From the great quantity of seemingly assimilable, or nutritious matter daily carried off with the urine; which either contained sugar, (although not, in general, perceivable by the taste,) or matter susceptible of the acetous fermentation; and from other symptoms, it seems reasonable to conjecture that the Diabetes in this, and other similar instances, consists

consists in deficient powers of the organs of assimilation. According to this notion, Diabetes may take place without the quantity of urine being necessarily greater than in health, and the presence of sugar perceptible by the taste may be considered only as casual. Hence also, such a disease may probably take place much more frequently than has been hitherto noticed; and such are, probably, many instances of atrophy, or consumption, which occur without any known local affection, in which the urine may be loaded with nutritious matter, as in the present instance.

It is plain, from these remarks, that I feel inclined to adopt, for the present, the theory you have so ingeniously framed, and so well supported by facts; namely, that Diabetes is not essentially a disease of the urinary organs themselves, but of the organs of digestion; although you may not think as I do, that the seat is not in the stomach, but in parts less remote from those in which assimilation of nutritious matter takes place.

Saccharine matter is not the immediate cause of Diabetes, but the effect of this disease; and if animal food is beneficial, and vegetable food is detrimental, it cannot, I think, be shewn, that it is because the former does not afford sugar and the latter does.

In support of your theory, that the Diabetes is not seated in the kidneys, it may be asserted

1. That

1. That the kidneys do not appear to be secretory organs, or organs which compound matters of a different kind from those which enter into them from the blood; for excepting, perhaps, the secreted mucus from the urinary passages, there is nothing in urine that does not exist in the same state of composition in the blood itself. The water and saline substances are all contained in the blood, and the mucilage of the urine seems to be the recrementitious part of the blood, mixed with secreted mucus of the urinary passages. The facility, and even rapidity, with which liquids, containing various impregnating ingredients, may be transmitted through the sanguiferous system and kidneys show, that the kidneys are rather to be considered as *separating* than *secreting* organs.

2. From the great relief experienced on taking a large quantity of mucilage in irritations from the urine, in various complaints of the urinary passages, it has been supposed the mucilage passes indigested to those parts.

It has been objected to this theory, that sugar could not be detected in the blood of patients, whose urine evidently contained it, and, consequently, that it must have been compounded in the kidneys; but the test employed, namely, the taste, does not appear adequate to the detection of the substance sought for, and that on two accounts. 1st. Because of its diffusion through
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so large a proportion of liquid. 2dly. Because the taste of the sugar may be obscured by its intimate mixture with a variety of salts and mucilages of the blood. And for these reasons also, sugar may be present in the urine, and not be perceivable by the taste, but yet it may prevent putrefaction, or render such urine susceptible of the acetous fermentation. It is well known that ale and other malt liquors, which are vapid, and not at all sweet, by keeping in bottles, in a due temperature, will again ferment, so as to be inebriating from the alcohol, and extremely acidulous from the great quantity of carbonic acid, compounded. These vapid liquors must, therefore, have contained either sugar, or matter capable of becoming sugar.

I understand also that you have made the experiment of dissolving sugar in serum of blood, and, as was to be expected, found that a certain quantity may be contained in it, and not be perceptible to the taste; but, like other extraneous matters in the blood, this quantity, when separated by the kidneys, may be insufficient to give a sweet taste to the urine. It has been attested by persons whose statements cannot be doubted, that the blood has, in some instances of Diabetes, tasted sweet, and that it had other properties denoting sugar. A single positive evidence of this sort ought not to be rejected by any number of negative ones. But, in short, blood and urine to most persons taste is
commonly

commonly somewhat sweet; and therefore, it seems not improbable, that there is in general, sugar both in the blood and urine of all animals at certain times. It is not doubted that the sweetness of chyle, and of milk, is from sugar. It seems also that the digestive and assimilating organs of animals compound sugar from merely animal, as well as vegetable aliment; as appears on examining the chyle and milk of animals which live entirely on animal food; namely, either those which are purposely fed, or which are naturally carnivorous. It does not seem that the fluids of animals which feed on saccharine matters, contain more sugar than those which feed on animal substances. Vegetables manured with merely animal matter contain as much sugar in their fluids as when manured with vegetable matter, or probably with sugar itself. But sugar can also be compounded by fermentation, without the aid of live powers, from dead animal matter and tasteless farina. These facts, it may be proper to notice, seem to justify the observation above made, that, on a theoretical ground, we might conclude that animal food was not likely to be either more beneficial, or less hurtful, than vegetable.

In this place it will be proper to point out, that fermentation is a more delicate criterion of the presence of sugar in urine than the taste; for the urine of the above patient did not taste sweet, but it fermented into acetous acid.

3. As

3. As great a variety in the appearances of urine is observed as in the alvine excrements, but in fluids secreted by glands, such great differences are not observed. Hence the urine has been justly called the feces of the blood. In diabetic disorders some observers have attested that the urine made a few hours after a meal had a chylous appearance.

4. Various other matters besides sugar may be contained in the blood of certain persons, and not be perceived by the taste, or other senses, nor even by chemical tests, but which are very evident to the senses, or to chemical tests, in the urine of such persons. I shall mention a few instances.

The odorous matter of asparagus was not perceived in the blood at the same time that the urine smelled strongly of it. I have administered oil of turpentine to several patients in such quantities, that the urine of all of them was strongly impregnated, but in the blood of one of these only could it be perceived by the smell. I have very often administered carbonate of potash, and soda alkalies in such quantities, that the urine effervesced with acids; and I precipitated from urine, containing potash alkali, supertartite of potash, on adding tartareous acid. In one trial I administered 800 grains of carbonate of potash in water, supersaturated with carbonic acid, between the hours of ten o'clock at night and two the following day

day in the afternoon. Blood was drawn at twelve on that day, and at which time urine was excreted impregnated with alkali, as just mentioned, but not a trace of this salt could be detected in the serum by the tests of violet juice, and of turmeric.

Nitrate of pot-ash has been given in large quantities, but it could not be traced in the blood, although it was readily detected in the urine.

5. If the Diabetes be essentially an organic disease of the kidneys, one might expect to see always such a diseased state on dissection; which, however, could not be perceived in Laurie's case above related. There are also dissections published by various persons, in a few of which only was any disease seen in the kidneys; nor are there, in general, any complaints of the loins, urinary passages, hips, &c. in diabetic cases. Wherefore, if organic affection takes place, it should be considered as an accidental attendant, or consequence; and in this light should be regarded the diseased state of the liver, spleen, lungs, &c. observed in some instances. At the most, such organic disease can only be considered as productive of one species of Diabetes, in which, on examination, it is probable the urine will be found to be very different from that in the other species of this disease.

The state of the mesentery should be more accurately attended to on dissection of diabetic patients. In Laurie's case above described, it was
observed

observed to be diseased, but I was not prepared at that time for examination of this part with a view to any theory. The urine ought also to be examined after the death of the patient, as well as while alive. In some cases, as the appetite fails the urine diminishes in quantity, and loses its sweetness a short time before death.

The theory that Diabetes is a diseased state of the assimilatory organs, accounts for some of its most characteristic symptoms; namely, for the urine containing sugar and other nutritious matters, the wasting of the flesh, frequent discharges of urine, thirst, hunger, weakness of the organs of voluntary action, &c. but it does not account for the quantity of urine much exceeding the quantity of drink. In some instances, the excess may be accounted for by reckoning the quantity of water contained in the solid food, and which amounts to much more than has been usually calculated, or conceived. But in other cases, taking the water contained in such food into the reckoning is not sufficient to account for the quantity of urine; and in such cases some addition may, on reasonable grounds, be considered to be made by the waste of the constitution of the patient. Water may also be compounded in the blood vessels, or other vessels; the constituent parts of it existing in all the fluid and solid parts of the animal œconomy; but that such a process goes forward is a mere
Y hypothesis;

hypothesis; and granting that in reality there is such a process, the supply of a large quantity of water by means of it cannot long continue, without symptoms of disease appearing.

In some instances the quantity of urine is much greater than can be accounted for from all these sources united. Cases are recorded in which twenty-five to thirty, and more pints, were discharged in the space of a natural day for many successive weeks, and even months; and in which the whole ingesta, as was said, did not amount to half the weight of the urine. The evidences for such cases are so numerous and respectable, that we cannot refuse to admit them; but, I confess, it does not appear to me that the quantities of drink have been fairly calculated; and if they had been so, it seems probable that the urine would not have so greatly exceeded the quantity of liquids swallowed, nor would birth have been given to several hypothetical and analogical explanations of the supposed superabundant quantity of water discharged to that of the drink. The explanation that water is absorbed by the skin from the air has been very generally accepted; but this has no better support than the analogy of the deliquescence of certain salts; and no experiments have demonstrated that water is absorbed from the air by the surface of the body. Another hypothesis, which has great ingenuity to recommend it, is, that an extraordinary
 quantity

quantity of water is compounded in the lungs themselves. I do not know the facts which countenance such a conjecture: nor in the 1st place, am I able to conceive that the process of the composition of water can go forward in the lungs to so great an amount, without any symptoms of it making their appearance in the pulmonic system. 2dly. Granting that in 24 hours there is an augmentation of more than eight pounds of oxygen gas inspired, which there must be to compound ten pound of water (where that quantity is to be accounted for) and supposing the ingesta to be able to furnish two pound of hydrogen, is it consistent that so large a quantity of oxygen gas can part with its caloric without a very extraordinary increase of the temperature of the animal œconomy? Or, indeed, be separated consistently with life?

I take leave, to close this paper, with a few remarks on the cure of the pulmonary consumption in the case before us.

1. Was this change effected by the warm weather of the Summer season? This certainly was not the only mean, for the disease had returned every successive Winter for several years with aggravated symptoms. The Summer season, however, might contribute with,

2dly, The discharge by the kidneys, by which the plethoric and inflammatory state of the lungs was lessened.

3dly. It seems but equitable to impute the recovery, at least in part, to the hydrocarbonate gas; in whatever way it might operate. But,

4thly. Ought not a great deal to be imputed to the emaciation which took place, during which process much of the matter of the constitution itself was absorbed, and, of course, the diseased state of the lungs might be particularly altered? The wasting of the flesh seems to have been beneficial in this instance. And, although the patient does not enjoy the firm and vigorous health he formerly did, yet his valetudinary state is not uncomfortable.

From DOCTOR MARSHAL, Lecturer on Anatomy and Surgery, London.

AGREEABLY to your desire, I have endeavoured to recollect the case of Diabetes that I mentioned to you. It occurred some years ago, when, with various engagements on hand, I could not attend to it, farther than to remark some very striking symptoms, and unusual appearances upon dissection: nor had this disease then excited so great curiosity as it has done since your judicious Treatise on the subject has been given to the Public. The following notes of the case (all that can be now made out) are submitted to your consideration.

HINTON LIDDEL, a carpenter, in Gray's-Inn-Lane,

Lane, whom I occasionally employed, a hard-working man, red-haired, thin, yet rather stout made, in November, 1783, took a draught of cold small beer, when in a profuse perspiration, from laborious work: it caused a sudden chill internally, and strange sensations occurred on a morning after; as an instance, he mentioned, that he felt a flap on the belly when none was received: his health altered, he became weak in the knees, and disinclined to rise in the morning. He was obliged to quit his business. What surprized him was the excessive quantity of water he began to make; and to this was joined great thirst. I tasted the water: it had a sickly sweetness, and was of the colour of rum. The thirst became almost incessant, aggravated by a heating down the throat: cold pump water was the drink he preferred: and he would stand at a pump near his dwelling, taking long draughts. If, from drinking the cold water, the thirst was allayed half an hour, it recurred ungovernable. Taking the mug, filled with water, in his hand, he would say, "You do not know what I suffer." It was not ascertained how much water he drank, nor how much urine was discharged, in twenty-four hours. His wife, not the fittest person indeed to observe accurately, being ill herself, was of opinion that he drank about four quarts a day, one of which was taken at his dinner: whether she meant twenty-four hours by a day, cannot

not now be known. This is recollected, that every night he drank out a pitcher of water, set by the bed-side, which shews that the thirst tormented in the night no less than in the day. His wife, according to her view of the matter, thought he made more water than he drank : her calculation was, that he often made two chamber pots full in the night, and three in the day, exclusive, no doubt, of unmeasured quantities made out of doors. Thus allowing the vessel used to contain a gallon, he must have made five gallons in twenty-four hours within doors. His skin was always dry ; even the toes constantly without moisture. Notwithstanding the great thirst and other illness, he retained a sharp appetite for food, and liked meat, particularly bacon ; but was always blown up and distended about the stomach after eating. Inclined to be costive. By some advice, and through the assistance of a friend, he went to Bristol in the Summer, where, drinking the waters of the hot wells, and, in fine weather, taking easy rides on the Downs, he recovered some strength ; and the perspiration was restored to the trunk and the upper parts of the body, and downwards to mid thigh. The thirst, however, did not abate ; but sometimes, in his rides, was so urgent, as to make him hastily get down from the horse, and drink out of the first ditch he came to. He returned home in Autumn. The complaint was stationary
through

through the next Winter and Spring. He went back to Bristol in the Summer following, that is, 1785. But after trying this Summer, he returned less relieved than before. The disease gained ground in the ensuing Winter. He became much weaker, and was emaciated. The skin, which had softened, by returning perspiration, to a great extent, became all dry and rough, of a dirty brown colour, and almost destitute of feeling. The legs and feet cold and dead, he said, "as a stone." He took up a strange conceit, that there was no blood remaining in his body, and with peevishness insisted that there was none.

About the latter end of this Winter, a permanent tumid fulness was perceived in the region of the stomach. Great sickness came on, with retchings and vomitings, and foetid eructations; a burning pain likewise in the stomach, and upwards into the œsophagus; pains in the bowels, and purging. What was thrown up by vomiting was a watery liquid, which, when left to settle, let fall a brown sediment. Cold water taken down into the stomach aggravated the burning pain: and now he drank less water, though parched with unabated thirst. He complained also of a heavy pain in the head, especially over the eyes: delirium ensued, in which he was difficultly kept in bed, and, as if mad with thirst, sometimes took up the chamber-pot, and wanted to drink the urine. When the

delirium was off, he bemoaned his condition, prayed for death, and wept at the thoughts of leaving his children orphans and in want. The quantity of the urine decreased, and the legs began to swell, and fill with water.

In the miserable state he was in, he still took food. On one of the last days of February (1786) when on the night-chair, he was seized with a deadly pain about the abdomen. "I'm death-struck," he said, "take and rip me up." Being lifted upon the bed, he became dreadfully restless, turning from one side to the other; very hot; in mute agony; sometimes dozing, as if from stupefaction, or some pause of the unknown uneasiness. In a few hours, he gradually sunk, and his sufferings ended.

Nothing has been said about the pulse: not that it was totally overlooked; and far less, that any idea is entertained that the pulse is unimportant in this disease. Real and essential alterations of the pulse must have occurred, though they were not, it is confessed, sufficiently remarked: upon a general recollection, it was not irregular, nor very frequent, nor, for a long time in the disease, very weak.

The body was opened on the day after his death. The first and most striking appearance was the colour of the blood. There appeared to be no proper blood in the body, but instead of it, a liquid
nearly

nearly resembling well made thin chocolate. All the veins were filled with this singular brown blood, which had a sickly, sweetish, slightly sour smell: (not tasted). The muscles and other parts usually red, or abounding in red blood, were not red, but of this chocolate colour. I was gratified in this body with a sight which I never had seen before nor since in the human subject,—chyle distinct, and abundant, in the great blood vein, which receives it from the thoracic duct: for the left subclavian vein being accidentally cut open, the brown blood issued, intermixed with abundance of white chyle, not unlike fine chocolate and cream but partially stirred. The kidneys, while they had the chocolate colour, were large, and the texture soft and flaccid; particularly that of the tubular uriniferous portion. The ureters not examined. Nothing unusual about the bladder of urine. Upon turning to the stomach, it was found about half filled with black, smooth, real mud, much resembling that long collected in a gutter near a blacksmith's forge (excepting a greater sliminess of the former). The villous coat, especially towards the cardia, was of a dark red colour (the only instance met with in this body of a real blood colour) and at the same time remarkably tender. The mud being taken out, was heaped on an earthen plate, and set aside. It was found some time after dried to a white brown earthy cake, like the dried materials

materials of a swallow's nest. Other parts not mentioned were understood to have nothing unusual about them.

The appearances in the dead body, which were unusual, were not, it would seem, all of them strictly morbid traces of the disease. The chyle, *propria formâ*, in the subclavian vein, was only a singular occurrence, which might have taken place without Diabetes: and the earthy mass, which produced the severest of the symptoms, hastened the death, and made it so violent a struggle, was probably but an accidental sediment from so much water, at all times, till the last of the illness, accumulated in the stomach.

From DOCTOR WILLAN, London.

August 6th, 1798.

A GENTLEMAN about 25 years of age, tall and thin, has been engaged in a fatiguing, though sedentary occupation, but always conducted himself with sobriety and regularity. For more than a year past he had found his health and strength gradually declining; he became pale, emaciated, and hectic; his hands and feet were unusually dry and hot; he had sometimes a trifling cough, and was affected with a great shortness of breathing, on
going

going up stairs, or any ascent. The case being deemed consumptive, he had been recommended to confine himself to a vegetable diet, and to spend as much time as possible in the country. This plan, however, was not attended with any sensible benefit: on the contrary, the wasting and general debility seemed to be daily increasing under it.

I did not see this young Gentleman till the middle of May last. In addition to the symptoms above-mentioned, he then complained of a clamminess in the mouth, a parched tongue, and an unquenchable thirst. His pulse was from 76 to 86, weak, and unequal. He was in general very costive. From these circumstances, I was induced to examine the state of the urinary secretion, before any thing was administered to him medicinally. The result of the first trial was as follows. He took in 24 hours $11\frac{1}{4}$ pints of fluid, consisting of milk, or milk and water, with two slices of toasted bread, and within the same time made 12 pints of urine, a portion of which was evaporated by Mr. Moore, of Apothecaries Hall; the result will be subjoined. The urine was of the highest straw colour, had a faint disagreeable smell, and was sweetish to the taste. His breath had, at this time, an unpleasant acidulous smell, nearly the same as that produced by the effluvia of decaying apples. He observed to me, that for several days past he had felt a pain in the head, and a stiffness, or drawing in of the eyes, with

with imperfect vision, the letters appearing double whenever he attempted to read or write.

A total change of diet seemed the only means of preserving this worthy young man from almost immediate dissolution. He commenced the plan without hesitation, abstaining wholly from bread, or other vegetable substances, and from all fermented liquors. For breakfast he took milk, with yolk of egg; for dinner, occasionally fish, but, in general, beef or mutton which had been long kept, sometimes a little ham; for supper, a poached egg, or calve's foot jelly, prepared without wine, or acid.

On the eighth day of this course, a second examination was made of the state of the urine, which amounted only to $2\frac{1}{2}$ pints in 24 hours, 3 pints of milk, or milk and water, having been drank within the same time. The urine was more high coloured than before, but had not wholly lost its faint smell.

A third trial of the same kind was made on the 10th of June. He drank 3 pints of fluid, and made exactly the same quantity of water. It must, however, be remarked, that the day was extremely chilly, and that he did not ride out, nor take any exercise through the whole of it. On the 12th of June, he informed me that his thirst was nearly removed, but that he felt a foreness of the stomach, and great oppression of it after eating, with
sickness.

sickness. These symptoms continued the three following days, which he spent in the country, and then ceased. From that time his stomach became reconciled to animal diet; his appetite and strength increased; he eat with a proper relish, and was not troubled with thirst.

On the 18th of June he drank 3 pints of liquid, and discharged only $2\frac{3}{4}$ pints of urine, which had the usual smell and colour. He stated that he had begun to perspire at night, which had not been the case for some time before; also, that he felt his hands and feet more moist and comfortable. The complaint of his head and eyes was likewise removed. June 20th his pulse was more firm; and he found himself recovering strength, so that he could walk a mile or two without fatigue. He eat heartily, slept well, and seldom drank between meals. On the 22d June some family concerns obliged him to set off for Yorkshire. He went, however, with the resolution of adhering to the plan of diet which had already so much relieved him, without the use of any medicine, excepting a little castor oil, as an occasional laxative.

On Saturday last, August 4th, in a letter, he informed me, that he bore the journey very well; but that some fatigue, and agitation of mind since, had much depressed, and enfeebled him. From this state, however, he recovered in two or three weeks; and he is now able to take considerable

able exercise either by walking or on horseback. He hopes to be in town soon, and thinks himself qualified to undertake business with as much activity as usual.

Experiments on the Urine.

EXPERIMENT I.

A wine quart of the young Gentleman's urine was carefully evaporated to about one fourth its quantity, and then exposed in a cold situation for several hours. By this time it had nearly lost a very disagreeable smell, which it possessed before evaporation. As no material separation could be perceived by standing, it was again cautiously evaporated on a sand heat, till it had diminished to about four ounces, which appeared very like treacle. It was poured into a gallypot, and set by in a window for two or three days, when, on examining it, I found nearly a dozen of large flies entangled. This was sufficiently convincing to me of its containing saccharine matter, without proceeding further. However, I conceived that an equal quantity of my own urine, treated in the same manner, by way of comparison, would be more satisfactory. This I did, but though exposed in the same situation for more than a month, not one fly was observed to go near it.

EXPERIMENT

EXPERIMENT II.

In about three weeks after, another quart of the Patient's urine was treated in the same way precisely; but the result was a much less quantity of the treacle-like matter; and no flies were perceived to come near it.

From MR. LEIGH THOMAS, Surgeon, Leiceſter-Square, London.

History.

I HAVE this morning (August 28, 1797) met with a confirmed case of Diabetes Mellitus; and, as I consider it a favourable one for a trial of the ingenious mode of treatment you have pointed out for the cure of this disease, I shall be happy either to give it up to your entire management, or co-operate in any plan that may be suggested between us.

The subject is a very industrious man, aged 38, by trade a watchmaker, much confined to business, and anxiously labouring for the support of a numerous family. These several years past he has been subject to a stomach complaint, attended with eructations; and last month was seized with the scarlatina anginosa, which disease had attacked several of the family

family some time before. Upon recovery, the cuticle peeled off the whole body, and an unusual degree of debility ensued, the appetite was voracious, with an almost constant sense of gnawing in the stomach; thirst, with a disagreeable clamminess of the fauces, became every day more troublesome, which obliged him to indulge in an extra allowance of porter; amounting in all, to the quantity of two or three quarts daily. He also took, by direction of his apothecary, large quantities of the bark, with a pint of port wine. These symptoms increasing, with a frequent and copious evacuation of urine, he was induced to taste it (from the recollection of a younger brother's case, who died seven years ago of Diabetes); he found it sweet; this confirmation of the disease alarmed him exceedingly; when he applied for my assistance the same day.

I shall now only briefly state his present situation, deferring any remarks upon the case until I shall have the pleasure of a personal conversation with you. He is of a thin delicate make, soft darkish hair, a clear skin, frequent flushings in the face, with dry hands; the lips florid and parched, with a collection of dry mucus at their angles; tongue white, except at the apex and round the edge, which at times is unusually red; the eye remarkably bright, and the whole countenance marked with a degree of anxious animation; he feels a constant uneasiness, with a sense of burning in the scrobiculus

serobiculus cordis with pain upon the slightest pressure, but I could not detect any induration in that part. His appetite is insatiable, the most indigestible food taken frequently passes off without producing the slightest inconveniency. His thirst is constant, and the restraint he labours under by not gratifying it, is extremely distressing. His bowels are usually constipated, when otherwise, he finds every symptom much relieved. *A phymosis*, with excoriation and itching of the prepuce, except after voiding the urine, at which time there is an intolerable smarting. He has lost all venereal appetite, neither the power nor will remaining. Constant pain in the back, confined chiefly to the lumbar region. The flow of urine, at present, is not excessive, but it is highly saturated with sugar; upon evaporation, a large proportion of saccharine matter remains. The urine is of a pale straw colour, a violet like smell, very transparent and frothy; little more than four pints is voided in the 24 hours, with frequent inclination, and a dribbling, which made me suspect stricture in the urethra, but a moderate sized bougie passed without any resistance. He is much emaciated, and loses strength and weight daily. He shewed me a letter from a brother of his, living in Kent, who also complains of pain in the back, and great debility, with an occasional discharge of sweet urine, especially after any fatigue of body, or distress of mind.

It appears that three brothers of this family laboured under the disease, but it could not be traced to either of the parents.

Treatment.

DOCTOR ROLLO having seen the patient, and favoured me with directions how to proceed, he very readily agreed to adhere to any rules laid down for his recovery. Sept. 2, 1797, he commenced eating animal food, and took fix or eight drops of hepatised ammonia thrice a day, with castor oil occasionally; his common beverage was water and beef tea. After pursuing this plan four days, the urine had entirely lost the sweet taste, and was greatly reduced in quantity; by the 18th he had lost the pain in the stomach, and the appetite became more moderate. The quantity of urine was now reduced to one pint and a half; he felt very weak; had a violent longing for vegetable food, particularly bread. I could not resist his solicitations, especially as I had a faint hope that the disease was conquered; I therefore allowed him a small French roll, with a glass of port wine. The urine made that night was highly impregnated with saccharine matter, and increased to the quantity of five pints. The following day, he again indulged a second time with bread and also porter, and so continued to deviate till the beginning of November, sometimes

times taking three pints of porter daily. In this interval, I ordered him the cinchona and sulphuric acid. His strength was improved, yet he lost weight. The gnawing pain at the stomach had returned, and also the itching and excoriation of the prepuce, the urine very sweet, and had increased to ten pints. The disease being re-produced, and its effects so considerably increased, the patient promised to be more resolute in future.

Nov. 20th, the animal food was again resumed, and, I believe, faithfully adhered to until the middle of February; the hepatized ammonia was laid aside; and milk was forbid, as I had strong reason to believe that it frequently produced sweet urine in the former trial. His strength, at the end of this period was greatly reduced; the gums spongy, with frequent bleedings, a foetid breath, and a rigidity of the muscles of the lower extremities. The urine had decreased to three pints, not at all sweet, was of a brown colour, and loaded with putrescent mucilage; in taste exceedingly salt, and much more pungent than urine in a natural state. The appetite was so completely destroyed, that the sight of animal food excited nausea, but, at the same time, there was a longing desire for vegetables and beer. His weight during this time varied something.

In November he weighed more than nine stone; in January, eight and a half; before the end of the course, he regained nine stone. The excoriation of

the prepuce had gone off, but the natural propensities never returned; the skin became moist, the clamminess of the fauces had disappeared. A great number of boils came out in different parts, which were exceedingly painful; some few advanced to suppuration, but never afforded true pus. Every diabetic symptom having left him, and his present state being so very distressing, induced me to allow him a small proportion of vegetable food. As we had experienced the ill effects of bread in the former trial, I directed him to eat sparingly of potatoes, and drink weak brandy and water; he drank also the alum whey. In two days after this, the sweet urine re-appeared, and all the other symptoms soon after returned. He never after this adhered to any regular plan, only taking vegetable food very sparingly.

About the middle of March, he had a severe attack of pleurisy, which required two bleedings, and other evacuations, to remove it. In April he passed some time in the country, twenty miles from town, where he constantly eat vegetables, and drank large quantities of mild ale; during this time, the urine was sweet only at times. Under these circumstances, he gained four pounds weight in nine days. After his return to town, his strength daily decreased; the boils frequently appearing, obliged him to lie almost constantly in bed. During the latter part of this period, the urine was very frequently

quently perfectly four, and that immediately upon passing off, so as to leave no doubt of its being so in the bladder; the taste and smell very similar to sour whey, but perfectly transparent; at this time, it was always small in quantity. In the beginning of July, he had another attack of pleurisy, which terminated his sufferings on the morning of the 16th.

As I have merely given a summary account of the progress of the case, I shall, in like manner, relate the effects of certain vegetables upon the disease, and which came under my own observation. Bread certainly holds the first rank in exciting the formation of saccharine matter; nor did this appear to depend upon the fermentation it had undergone, as the sea-biscuit, or a teaspoonful of flour in melted butter, universally produced the same effect; potatoes stood next; onions, leeks, radishes, and turnips, also produced much sugar. Preparation by boiling, or otherways, did not seem to increase or diminish their effects. Spinage, carrots, peas, broccoli, and cauliflower, had each less effect than the former, particularly the two last; parsnips were eaten with impunity. The urine never tasted sweet after taking them; at first, the urine had a sourish taste and smell, which I attributed to them, but since, it has been perfectly four, without being able to account for it. Every kind of fruit invariably produced sweet urine, without be-

ing able to ascertain any variation in their effects. Of liquids, porter appeared the most hurtful; no difference could be observed with regard to the effect of any of the spirituous liquors, wines, or cyder; mild ale he considered as having no effect in producing the disease, but of this I can say nothing of my own knowledge, as he only drank it in the country. He was bled five times in the course of the treatment, purposely to examine the blood; in one instance only had the serum a turbid wheyish appearance; the nicest tests could not at any time discover any thing of a saccharine quality. Upon allowing the blood to evaporate in the open air, no putrefaction took place, it became a solid brittle mass, of a shining appearance when broken.

Dissection

Twenty-four hours after death, under the directions of MR. CRUIKSHANK *, I proceeded to make a careful examination of the viscera. The thorax being the seat of disease which was the immediate cause of his death, my attention was naturally first directed to that cavity. Upon separating the sternum, about three pounds of a serous fluid was found surrounding the right lobe of the lungs. The pleura lining the ribs, as well as the pleura covering the lungs, were pretty generally covered with a thick crust of coagulable lymph;

* Of Leicester-Square.

lymph ; and for the space of an inch or two, a firm adhesion had taken place between them, in consequence, I apprehend, of a former attack of pleurisy, which had happened two months before, the water also appeared to have been produced from the same cause. The lung of the left side was perfectly healthy in every part, of a dappled bluish colour. The lymphatics upon the surface were by no means numerous, but of a much larger capacity than common, so as to admit of injection with Size coloured with vermillion, which passed unchanged into the deeper seated ones, and returned by a large trunk passing on the side of the branch of the trachea belonging to that lobe. The heart was unusually fat, both auricles were much distended, and the right ventricle contained a small quantity of fluid blood. The liquor pericardii was of the common proportion. Upon opening the abdomen, the omentum appeared more fatty than might be expected from the emaciated state of the subject. The stomach, with its coats, appeared unchanged, except upon its internal surface, where inflamed patches were found, as well as in different parts of the alimentary canal, through its whole course. This appearance may have been produced by the action of repeated violent cathartics, that were taken two days before, to remove an obstruction in the bowels of a week's standing. The duodenum contained only a small quantity of a dark coloured fluid,

chiefly bile. The mesentery was exceedingly fat, inclosing between its duplicature of peritoneum a few absorbent glands, not larger than the section of a garden pea. I could not, with the greatest attention, observe any lacteals coming to them, nor discover any upon the intestines, even after putrefaction had taken place. The thoracic duct was small, and its coats appeared thicker than usual; but whether this appearance arose from its contracted state, I cannot determine. The spleen, with regard to its structure, appeared every way healthy, of a leaden colour, and the size larger than common. The pancreas was found, and its duct of the usual diameter. The liver perfectly healthy, and of a moderate size; upon its convex side, the colour was of a brighter red than towards its edge and the under surface; very few of the superficial absorbents were visible. The gall bladder much contracted, containing only a small quantity of dark green bile of the usual consistence. The kidneys were rather smaller than common, affording a resistance to the pressure of the thumb and fingers, such as I have generally perceived in the most healthy. Upon the under surface of the right kidney, a small collection of pus was found (somewhat like a scrophulous tubercle suppurated); this abscess was very superficial, and its extent did not exceed the size of a silver penny. I conceive it could not have interfered at all with the secretory function of the gland.

A longitudinal

A longitudinal section was immediately made through one of the kidneys, so as to divide it into two equal parts, passing the knife from the large curvature toward the smaller. This view afforded nothing uncommon in appearance, except its general redness, which was greater than usual, and which made me conclude (Mr. Cruikshank agreeing with me in opinion) that there was more than the common determination of blood to this organ. The superficial vessels did not appear to be distended, nor was the dimensions of the emulgent artery, or vein, enlarged. The other kidney was preserved, and carefully injected with Size (coloured differently) by the artery, vein, and ureter. The red injection by the artery had found its way into some of the tubuli uriniferi, and also the blue into a few others by the vein, but the most numerous were those filled with the white injection by the ureter. Upon removing the capsule, the cryptæ upon the external surface were observed very distinctly, but not so large as may be seen in some preparations of the same kind in Mr. Cruikshank's collection, where no disease was known to exist. The internal view shewed nothing remarkable, either in the size of the mamillæ or the arrangement of the tubuli, nor was the ureter, or its pelvis, any ways enlarged. The renal capsules were less than usual, but without any apparent deviations from the natural structure. The bladder found, containing
about

about fix ounces of insipid urine, not being able by the taste to detect either sugar or salt. The vesiculæ feminales were shrunk. The prostrate gland, by the feel, appeared of the usual size and structure. The brain was firm, and had nothing peculiar in its appearance. The vessels of the pia mater were turgid, and a quantity of serous fluid was thrown out upon the brain, but not more than the common quantity was found in the ventricles.

Some Remarks on these Communications.

THESE communications are of great importance in the further elucidation of the history, nature, and treatment of the Diabetes Mellitus; and they will probably supersede any more cases in detail. A concise account, however, of such as are attended with new circumstances, and which have terminated, either successfully or fatally, with dissections, must still be required.

The continuation of WALKER's case, as described by DOCTOR DE LA RIVE, shews the same unsteadiness, and inefficacy of any other means than the animal diet, and likewise that his patient, by more perseverance, might have obtained a perfect cure.

DOCTOR GERARD's first case points out a corresponding effect in the female as in the male, by the
irritating

irritating stimulus of the saccharine matter in the extremity of the urethra; it also exhibits the effect of vomiting in diminishing the quantity of the urine; and alludes to some advantage having been obtained from the carbonate of ammonia. The second case marks a dropsy previous to the diabetic accession; also the same affection of the urethra as the other; and the patient having more resolution in complying with the means of cure, was likely to obtain a restoration of health. Both shew the propensity to deviate from a rigid observance of the animal diet, and the conviction that it is efficacious when strictly pursued.

DOCTOR CLEGHORN'S continuation of the cases of *Roger* and *Maclean*, afford additional satisfaction, but more particularly that of the latter. This man died evidently under the effects of a lung disease, during which the Diabetes had not returned. From the appearance of the lungs on dissection, it was supposed that they had been affected previously to the diabetic attack; or, at least, that they were disposed to inflammation, on getting cold, while in the infirmary with the disease. Dissection, while it exhibited no morbid derangement of the kidneys, neither did it of other parts. It is said, the kidneys, though sound, were more flaccid than usual, and that the bowels were very pale.

He gives also a concise account of four other cases of the Diabetes Mellitus, treated in the Glas-

gow

gow Infirmary. The first of whom was a man who caught cold under mercury, to which the patient ascribed his disease: he got completely well by the animal diet. The insensibility of his stomach to emetic medicines is attributed to an original peculiarity of constitution, which had no connection with the Diabetes. The remaining three patients were women, one of whom had the disease while giving suck, which obliged her to wean her child. Had this patient been admitted during her nursing, it might have been ascertained whether the milk contained more than the usual proportion of saccharine matter. The other two cases shew only the efficacy of the animal food. There is a fifth mentioned as being under the treatment, with equal hopes of success.

The Doctor takes notice of a singular disease among horses, which had some general resemblance to the Diabetes in the human subject. The urine of one of them was hastily examined, and it was found four.

In his letter of the first of July, he gives an account of an acute disease, which attacked one of the diabetic patients, after her dismissal from the infirmary, terminating fatally. The dissection shewed inflammation of the bowels; it also exhibited the kidneys as being enlarged, uncommonly soft, and pale. From this case, and that of *Maclea*n, the Doctor supposes, that animal food, when so rigidly

rigidly persevered in, strongly disposes to inflammatory affections.

DOCTOR STORER had met with seven distinct cases of the disease, and he avers with DOCTOR CURRIE, that after it had been completely formed, he had never seen it cured by the former methods of practice. He gives a satisfactory account of DOCTOR ALDRICH's case, the Gentleman of 77 years of age; which shews the effects of our plan of treatment in a very favourable and impartial point of view. He joins in the common regret, that the great desire for variety of aliment, forms a strong bar to the successful application of a diet consisting entirely of animal food. He describes a case where BULIMIA preceded as well as accompanied the diabetic disease. The account of a mild or chronic species of it, as prevailing in families is important. In this form it is said to be occasionally suspended, and the patient may live to a tolerable age. It does not seem, so far as the DOCTOR's observation has gone, to depend on any constitutional disposition; neither does he determine whether this constitutes a difference in the nature, or merely in the degree of the disease.

DOCTOR JAMESON's case of *Nixon* exhibits a distinct history of the disease, which had been of eighteen months standing. The animal food reduced the saccharine and extractive matter from three ounces, which had been obtained from a quart

quart of the urine to one ounce and two drachms, in the short space of 19 days. On the whole, it furnishes an instance of the efficacy of our plan of cure.

MR. SHIRREFF'S attentive observation has rendered his diabetic case interesting. The subject of it is of an earlier age than that in which the disease commonly appears; a stomach affection evidently preceded it, during which she eat freely of fruits and sweetmeats. It would seem, that the urine undergoes manifest changes, at different hours after eating, which is more remarkable, according to the substances eaten. In this case, after partaking of vegetable matter, it was found clear, and sweet; the next portion higher coloured, and insipid; and when the interval was long, as in the night, the urine was more natural. This is an important fact in support of the opinion, that the saccharine matter is evolved during the process of digestion.

MR. HOUSTON'S patient shews also, a long continued stomach affection, previous to the detection of the Diabetes, during which she likewise indulged in the liberal use of fruit: but in this case the mind was particularly concerned, being under the influence of the depressing passions. The circumstance of the acid urine is singularly curious; but it remains to be further ascertained: DOCTOR CLEGHORN, it may be remembered, has mentioned, that

that he found the urine sour, in the case of the horse disease.

DR. PEARSON'S three cases, with the ingenious remarks accompanying them, are valuable.

The *first*, shews the same insensibility to emetics, as in one of the cases related by DOCTOR CLEGHORN. The dissection exhibited no morbid appearance, or even any change of the kidneys, or any other part, except in the mesentery and bladder, which were found thickened. The urine contained in the latter was not sweet. This case is peculiarly important to us, from the dissection having shewn no change whatever, in the natural appearance of the kidneys; a fact strongly supporting our doctrines.

The *second* gives a very distinct account of the disease, which was treated in the best manner, by the remedies usually employed at that time; but without relief.

The *third* contains facts and arguments, in opposition to the theory of the disease, as depending on a primary affection of the kidneys, which must have their weight. The opinion, with regard to the effects of animal and vegetable food, in the formation of saccharine matter, differs from that we entertain. It is an incontrovertible fact, that animal food solely used, deprives the urine of every portion of saccharine matter, so completely, as not to be discoverable by any chemical process, nor by fermentation.

fermentation. See DOCTOR GERARD's case, *page* 215. The experiments of Mr. CRUIKSHANK not only shew the difference between what may be termed animal and vegetable sugar; but that the sugar in diabetic urine is very probably the entire product of vegetable substances. There are also some other points in which we cannot perfectly agree; but these will appear from our general account of the disease, &c.

DOCTOR MARSHAL's case is valuable. The appearances on dissection shew the state of the kidneys, which has been frequently met with in this disease: but the peculiar condition of the stomach and blood have not been hitherto found, at least not described. The stomach exhibited marks of disease; and as the villous coat was of a red colour, an increased action of its vessels having happened, was apparent. The peculiar smell of the blood, pointed out a great deviation from the natural state; but it is to be regretted that it had not been more particularly examined. The circumstance of the unmixed chyle is singular. The whole, we apprehend, justifies this conclusion, that more morbid changes in the organic powers of assimilation, than of any others in the body, were manifested; of course, we deem it a fact strongly in favour of our doctrines of the disease.

DOCTOR WILLAN's case exhibits a very successful

ful adoption of the animal food, without the use of any other remedy. The disease had been probably of twelve months duration, and was attended with nearly its worst symptoms. In eight days the urine was reduced from 12 to $2\frac{1}{8}$ pints in the 24 hours; and in 14 days more, it was probably deprived of the unnatural proportion of extractive, as well as saccharine matter. In five weeks, the recovery seemed to be far advanced. If the same steadiness of conduct, in adhering to the dietetic treatment, continues, there is every reason to expect a perfect restoration of health; and it will furnish an additional fact, in support of our opinions of the nature and treatment of the disease.

MR. THOMAS'S case, from the minuteness, accuracy, and result of the dissection, throws considerable light on the nature of the Diabetes Mellitus, and affords another remarkable fact in favour of our ideas on the subject. The apparent natural condition of the abdominal viscera, demonstrated that the disease did not depend on the derangement of the structure of any organ. The morbid changes which may have been found in other dissections, must have arisen from the long continued morbid action upon particular parts, forwarded, probably, in some instances, by a favourable pre-disposition, especially that connected with scrophula. The circumstance of three brothers having the disease, shews some pre-disposition, which may be hereditary.

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The effects of various vegetable substances on the urine will improve the practice. The observation that the urine had been voided in an acid state, corresponds with what has been mentioned in MR. HOUSTON'S case, and by DOCTOR CLEGHORN. This, with several other cases, shews the pre-disposition in diabetic patients to inflammatory diseases. The failure of tonic and astringent remedies, with the effects of vegetable food, and the successful administration of opposite means, confirm the opinion that this peculiar disease is accompanied with a state of constitution very different from that in scurvy. In this case, the patient had an attack of pleurisy, in the month of March preceding that of July, which proved fatal. As active diseases of this nature have been found to suspend the Diabetes Mellitus, the intervening circumstances which occurred in it, between the two attacks of the pleurisy, might somewhat have depended on the sequel of the first, as it was the opinion of Mr. Thomas, part of the diseased appearance of the right lung, with the effusion in the chest, was the effect of that attack.

Conclusion.

The whole of the communications we have received in this, and the former section, seem to illustrate many circumstances, and contribute to
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establish many points in the general view we are to exhibit of this very curious disease. It may, however, be suggested, that some of them are incomplete, as not having been terminated either in absolute cure or death, while others are accompanied with remarks which militate against some of our opinions. It is true, some of the cases may be said to remain indecisively cured; but the progress of these have been marked by many elucidating circumstances, and their final recovery may solely depend on a proper application, and steadiness in the means of treatment we have recommended. Whatever the event may be, it will be recorded, according to the accounts we may receive from those under whose charge the cases remain. Those cases, which may be accompanied with any remarks interfering with our opinions regarding the disease, will equally serve to excite further enquiries, and to shew the motives which influence our investigations.

CHAP. III.

A concise Narration of what has been written, or advanced, respecting the Diabetes Mellitus.

DOCTOR WILLIS,

IN his account of the Diabetes Mellitus (English translation of his works, in folio, in the year 1684) observes, that an ill sort of diet, and especially a daily and immoderate drinking of cyder, ale, or wines which are acid; sometimes also sadness, or long sorrow, as likewise convulsions, and other depressions and disorders of the animal spirits, are causes of the disease: he knew an instance of one person, who drank Rhenish wine as his ordinary drink for twenty days, having so severe an attack of the disease, as to die of it in a month. He says that both reason and experience contradict the use of astringent remedies; while they justify the use of alkalis, lime, and hypnotics, or sleepy medicines. The case of a nobleman is given, who had the disease two or three times apparently removed, by a regular milk diet, some simple remedies, an anodyne at night, with the use of lime water.

DOCTOR

DOCTOR MEAD

Says (quarto edition of his works, in the year 1762) that the Diabetes Mellitus happens most frequently to those, who, without due exercise, indulge themselves in drinking vinous liquors, and then quench the thirst arising from these by too great a quantity of such as are cooling. The disease is more immediately attributed to a morbid affection of the liver, with a vitiated mixture of the bile. With respect to the cure, he observes, that it chiefly consists in supplying the blood with a quantity of fixed salt, particularly such as is contained in lime water, and that of Bristol; he likewise recommends alum whey.

DOCTOR METZ

Recites a case in the fourth volume of Haller's Disputations, which, from the symptoms, and result of the evaporation of the urine, was most probably the Diabetes Mellitus. A great variety of the usual astringent remedies were employed without benefit; but temporary relief seemed to have been obtained by blood-letting, although in a very small quantity.

DOCTOR DOBSON,

In the case of *Peter Dickenson*, recited in the 5th vol. of *Medical Observations and Inquiries*, p. 298,

as having occurred in 1772; hard labour when very hungry is stated as one of the causes, to which his patient had sometimes been exposed. An uneasiness about the stomach, and a perpetual gnawing sense of hunger, with thirst, were among the first symptoms. The disease was like that of our first case, acute, and rapid, and of about the same duration. During a seven months' treatment in the public hospital at *Liverpool*, some benefit was derived; but from the jumble of things no preference to any one remedy can be assigned. The warm bath, antimonials and opiates were among the medicines; but there were also bark and elixir of vitriol. His diet was probably such as would maintain the disease in defiance of any proper medicine; among other things, small beer and acidulated water were allowed for drink.

The blood of this patient resembled the blood of our first case, but apparently contained more sugar. The urine shewed appearances, and gave results, pretty much the same, though it seemed to contain more sugar, and less saline or animal matter.

He supposes that the disease is an affection of the general system, depending on a species of imperfect digestion and assimilation. The saccharine process he imagines is not at an end after the formation of the chyle, but is still further carried on in the course of the circulation. The indications
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of cure he states to consist in strengthening the digestive powers, in promoting a due sanguification, and establishing a perfect assimilation through the whole œconomy ; though he admits that the cure has been hitherto unsuccessful.

He observes, that the Diabetes proves in some a very rapid consumption ; and that he has known it to terminate fatally in less than five weeks.

This case is of much importance in any investigation of Diabetes ; the blood of our first case, though imparting no sensible sweetness, yet its wheyish taste, spontaneous changes, and its finally resisting putrefaction, afford marks of a saccharine impregnation, and strongly supports the fact related in it, of the serum having been found sweet.

DR. CULLEN.

This great man had met with the Diabetes twenty times, and though he entertained opinions of its nature similar to that of Dr. Dobson (indeed he has alledged that those opinions were communicated by himself to Dobson, who had prosecuted them farther), yet he concludes his observations on the disease with these words, “ The proximate cause being so little known or ascertained, I cannot propose any rational method of cure. From the testimony of several authors, I believe that the dis-

ease has been cured ; but I believe also that this has seldom happened ; and when the disease has been cured, I doubt much if it was effected by the several remedies to which those cures have been ascribed. In all the instances of the disease which I myself have seen, and in several others of which I have been informed, no cure of it has ever been made in Scotland, though many instances of it have occurred, and in most of them the remedies recommended by authors have been diligently employed. I cannot, therefore, with any advantage enter into a detail of these remedies ; and as the disease, together with its several circumstances, when they shall hereafter occur, is likely to become the subject of diligent investigation, I avoid going farther at present, and judge it prudent to suspend my opinion till I shall have more observations and experiments upon which I can form it more clearly.” *First Lines of the Practice of Physic.*

In taking notice of the opinion that the disease might be a kidney affection, he observes, “ It seems to have been sometimes connected with calculous affections of the kidneys ; and it is possible that an irritation applied there may increase the secretion of urine. It perhaps often does so ; but how it should produce the singular change that takes place in the state of the urine, is not to be easily explained. It certainly often happens, that
calculous

calculous matters are long present in the urinary passages, without having any such effect as that of producing Diabetes in any shape. Some have supposed that the disease occurs from a relaxed state of the secretory vessels of the kidneys; and, indeed, the dissections of persons who had died of this disease have shewn the kidneys in a very flaccid state. This, however, is probably to be considered as rather the effect than the cause of the disease. That no topical affection of the kidneys has a share in producing this disease, and that a fault in the assimilation of the fluids is rather to be blamed, I conclude from hence, that even the solid food taken in, increases the quantity of the urine voided, at the same time with an increase of the saccharine matter above-mentioned."

DOCTOR HOME

Commences his account of two cases of the Diabetes Mellitus, in his Chemical Experiments, 2d edition, page 319, with the following opinion; "There is no disease that has been so little improved in its history, theory, or cure, as the Diabetes. Aretæus has given the best description of it. All attempts to explain its pathology have hitherto been fruitless; and it is yet, in its advanced state, incurable. This must in some measure be attributed to the variety of the disease." And he concludes, "Thus these two patients exhausted
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all that experience had ever recommended, and almost all that theory could suggest. Yet in both cases the disease resisted all the means of cure used. When we are convinced of this, these histories are not without their advantage; as, by shewing that the field is quite open, we may hereafter hope for some more successful attempt."

One of the patients had the disease three, the other four years. They were bled, but the serum is said to have been in both without sweetness; the blood of one had an inflammatory crust. The urine was sweet, and that of one of them, evaporated by DOCTOR BLACK, gave an extract similar to that of our cases; and it is remarkable the quantity of extract yielded, as well as in DOBSON'S case, amounted to nearly the same weight. The appetite in both was much greater than in good health; in one of them it was voracious. In both it was attended with great thirst, but in the one with the voracious appetite it was immoderate and unquenchable. One of them was under cure $2\frac{1}{2}$ months, and dismissed in the same state in which he was admitted. The other, who had the disease four years, died; and the following appearances on dissection are described: "On examining the kidneys, the left was larger than natural, and its substance softer; there was no uncommon appearance in the right kidney, except a greater degree of softness. The substance of both kidneys had a sour odour.

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The ureters were of a natural size. The coats of the bladder were stronger than common ; and no lacteals could be observed about the neck of it, though some have suspected that much of the fluid is deposited in the bladder, by a retrograde motion in the lymphatics. All the glands of the mesentery and mesocolon were enlarged, of a pale colour, and of a firm consistence. The vascular system of the mesentery was rather large. The liver was natural, and had some firm adhesions to the colon. The large intestines were much loaded with hard faeces. The rest of the abdominal and thoracic viscera were natural. The kidneys were afterwards sent to DOCTOR MONRO, for further examination ; and I received the following letter from him : “ The kidneys of your patient were unluckily cut open before I received them, which put it out of my power to examine them properly, by injecting their vessels. I regretted this the more, because I had long ago found it possible to make an injection coloured with vermilion, pass from the renal artery into the uriniferous tubes, when there had been no previous disease of the kidney. Both kidneys seemed to be of a large size, were of a remarkable pale colour, and felt rather softer than common. No other difference in the texture of the vessels, or solid parts, could be distinguished by the naked eye or with glasses. The smell of both kidneys was certainly different from what I had

had ever observed, being in some degree four as well as putrid."

After reciting the various opinions which had been entertained of the disease, he goes on: "Were I to give a theory, to explain the nature and symptoms of this wonderful disease, I would say, that it arises from a defect of the animal or assimilatory process, by which the aliment is converted into the nature of our body. I have long looked on the excess or defect of this process, as the source of many disorders. All putrid diseases, the scurvy, &c. seem to be owing to its excess; acidity of the stomach to its defect. Among the latter the Diabetes may be arranged. For, 1st. The remote causes shew it. It arises from what debilitates the body, as moisture, preceding diseases, great evacuations, &c. by which it becomes incapable to assimilate the food. So Sydenham thought, *assimulandis succis protinus impar est*. 2d. The white chylous matter, which is often secreted with the urine, shews that the vegetable part of the chyle is not assimilated. The dilatation of the urinary excretories cannot alone account for this, as the serous part of the fluids would then escape too, which does not happen. 3d. Sugar is found in diabetic urine. Sweet chyle is the first product of the stomachic and intestinal digestion; as chyle, in the thoracic duct, and milk, which is a speedy secretion of it, contain much saccharine matter. This

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is changed in some hours, by the animal process into an ammoniacal salt, which is that found in all the excretions. But the saccharine salt still remaining in diabetic urine, which is the most perfectly animalised fluid, shews that there is great defect in the animal process. 4th. Urine being of a septic nature, runs fast into putrescency. But the diabetic urine turns acidulous; and with, as well as often without yeast, undergoes the vinous fermentation. Those peculiarities shew its vegetable nature, as vegetable juices alone are capable of the vinous and acetous fermentations. It likewise shews, that it is the saline parts alone of bodies that ferment; for the fire must have coagulated the mucilaginous particles, had there been any in the diabetic urine. These vegetable salts shew a defect in the animal process. These arguments appear more convincing than any of the former; but it may be objected to them, 1st. That animal food should cure it, which it did not. (DOCTOR HOME has been gratified in knowing that animal food will cure, at least that it is the first and most essential step towards it.) 2d. That septics, which brought on putrid eructations, made no change (those, however, are now found to contribute to the cure, and will therefore add to the Doctor's gratification). 3d. That the proportion of saccharine matter is much greater in their urine than in milk.

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But milk has not perhaps the whole saccharine salts of the chyle."

The Doctor then adds, " If the theory alone of this disease was defective, it would be a matter of less consequence. But, from what we are to relate, the cure is fully as imperfect."

The remedies used in both cases were sudorifics, antispasmodics, stimulants, astringents, tonics, in-craffants, and septicis; but no determinate good effects were produced by any of them.

DOCTOR HOME's account is altogether of a mixed nature; much of it approaches to the real nature of the disease; much is expressed in doubt; and much is left open for farther enquiry: but on the whole, it is the most comprehensive account of the disease with which we are acquainted, and deserves attentive perusal, by those who are inclined to consider this peculiar complaint.

From the observations of DOCTOR HOME, with regard to skin absorption in augmenting the quantity of urine, no certain conclusion can be drawn.

DOCTOR DARWIN.

In the first volume of his *Zoonomia*, page 318, a case of Diabetes Mellitus is recited, which occurred in the Infirmary at *Stafford*, and was somewhat relieved by opium, given to the quantity of three grains every four hours. Rosin was also tried.

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During the use of the opium the patient sweat much in the night, so as to have large drops stand on his face and all over him. He was bled, and the blood was found to have the common appearances, except that the *serum resembled cheese whey*. From which it is concluded that the saccharine matter does not enter the blood vessels, though formed during the process of digestion, but that it is conveyed to the bladder by a supposed urinary branch of absorbents connected with the lacteals by many anastomoses, and whose motion in this disease are inverse or retrograde.

In this patient the thirst was great, and his appetite such, that he eat twice as much as other people, and complained of a rising in his throat, like the globus hystericus. The disease terminated fatally, and did not appear to have exceeded in duration 12 or 13 months.

On this case Dr. Darwin observes, that the rising in the throat, and the twitchings of his limbs, seem to indicate some similarity between the Diabetes and the hysteric disease, besides the great flow of pale urine, which is common to them both. Perhaps if the mesenteric glands were nicely inspected in the dissections of these patients; and if the thoracic duct, as well as the larger branches of the lacteals, and the lymphatics, which arise from the bladder were well examined by injection, or by the knife, the causes of Diabetes might be
more

more certainly understood. The opium alone, and the opium with the rosin, seem much to have served this patient, and might probably have effected a cure, if the disease had been slighter, or the medicine had been exhibited, before it had been confirmed by habit during the seven months it had continued. The increase of the quantity of water on beginning the large doses of rosin, was probably owing to his omitting the morning doses of opium."

So far DOCTOR DARWIN. The case appears to us of importance, as shewing, 1st. That the *serum of the blood had the appearance of cheese whey*, and thus resembled that of our first case. 2d. That opium reduced the quantity of urine from 18 to 8 pints a day, and produced a moist skin, or rather sweating : and 3d. That rosin increased the quantity of urine. Therefore it corroborates our opinion of the general diffusion of saccharine matter (though, from the serum tasting salt, he draws an opposite inference, *see our first Case*), of the nature of the stomach's action, and the dependence of the quantity of urine on it, as well as the stimulus of the sugar, for the rosin acting as a stimulant, increased this discharge, while the opium, as a narcotic, diminished it ; and from the effects of the latter, an entire diet of animal food along with its use was only wanting to have brought about a cure.

DOCTOR

DOCTOR RICHTER, *of Goettingen,*

In his Medical and Surgical Observations, (English translation of 1794) has a chapter on Diabetes; but his account is by no means precise or distinct; and though he evidently alludes to the Diabetes Mellitus, yet, from some of his observations, he probably comprehends other species of the disease. His opinions, however, of the nature and treatment of Diabetes are not destitute of satisfactory points.

Diabetes appears to him to be generally of a spasmodic nature. “According to my experiments, it is occasioned by a stimulus which acts upon the kidneys, and hence a *secretio urinæ aucta*, sometimes also *perversa* is the consequence. When we cannot discover the particular irritation, nor remove it, I believe that antispasmodics are the proper remedies for this disease.”

One case, where 30 pounds of urine, as clear as water, were made daily, and accompanied with a small quick pulse, and an uneasy sensation and fulness in the region of the stomach, an emetic immediately removed the disease. Another patient is said to have had temporary removals of a species of Diabetes by antimonials and warm baths; but on some scorbutic symptoms appearing he got wort to drink, during the use of which the disease disappeared. A third case was cured in

10 days by tartar emetic and valerian. And in a fourth, ipecacuan easily produced vomiting; and as often as the patient threw up, the disease disappeared for 24 hours.

“The alternate increase, and even total intermission of this disease, do not, I think, allow us to ascribe it to weakness and relaxation of the kidneys alone.”

“Tonics are here seldom useful. BRISBANE asserts that Peruvian bark, and all strengthening medicines, are for the most part hurtful. And if they sometimes should have done good, was it not by diminishing irritation and irritability?”

“In my opinion, the chief thing is to find out and remove the irritation which acts upon the kidneys; and when this cannot be discovered, to counteract its action upon the kidneys by sedatives and antispasmodics.” He recommends camphor in emulsion as deserving a trial.

The opinion of DOCTOR DOBSON, that the Diabetes arises from an imperfect assimilation, and that of DOCTOR BRISBANE, who imputes it to a peculiar kind of colliquation, DOCTOR RICHTER equally rejects, as having little probability. “For in most patients no signs of colliquation are found, not even in the urine, no previous cause of colliquation, or of impeded assimilation. The disease frequently comes on very quickly. The functions of the organs of digestion are unimpaired, &c.”

DOCTOR

DOCTOR RICHTER, in the same work, has a chapter on acidity in the stomach, wherein he relates a case of St. Vitus's dance, connected with an extraordinary acid state of the stomach; and which was cured in eight days by a mixture of equal parts of asafœtida and ox's gall, in doses of a scruple three times a day. Afterwards the medicine was continued three weeks.

In DOCTOR HOME's fatal case of Diabetes, asafœtida was exhibited. "I gave him a drachm of asafœtida in the day; but it took away his appetite, was attended with a feverish state, and was at last given up, as disagreeable to him. It appeared rather to hurt him. However, the asafœtida seems entitled to a trial in Diabetes Mellitus, as being probably possessed with the power of diminishing the action of the stomach.

DOCTOR CAWLEY, of *Jamaica*,

In the *London Medical Journal* for the year 1788, page 286, relates a case of Diabetes which terminated fatally, after the use of a "variety of medicines, which were successively administered, as the usual consequence of inefficacy and despair. Decoction of bark with vitriolic acid and alum, with astringents and aromatics, with chalybeates, with fœc. saturni and opium, and with cantharides, together with cold bathing in salt water, were the

B b 2 principal

principal means used, and at first they had a very good effect; but soon afterwards every medicine disagreed with the stomach, and the patient gradually sunk and died." Previous to this event the quantity of saccharine matter had decreased, and the urine had become deeper, and of a more natural colour. The appetite had also gradually diminished, and latterly was changed into an aversion to even the sight of solid food. This patient, before the diabetic attack, had been accustomed to free living, and strong corporeal exertions in the pursuit of country amusements.

Appearances on Dissection.

"The kidneys were of the usual size, but appeared to me to be rather paler and softer than what is natural; when opened longitudinally through the pelvis, nothing preternatural was discovered. The liver was much wasted. It was externally of an ash colour, or nearly like pipe clay, and its consistence was very plastic, or resembling an oedematous humour, which might be moulded, as dough, into any shape. It was perfectly free from any scirrhus or steatomatous tumours, taken notice of by DOCTOR MEAD, and, when cut into, exhibited its usual colour. The gall bladder contained its accustomed quantity of bile, and adhered to the mesocolon. The pancreas was full of calculi,

culi, which were firmly impacted in its substance. They were of various sizes, not exceeding that of a pea, white, and made up of a number of lesser ones, which made their surface rough, like mulberry stones; and in all respects they appeared analogous to the calculi which we sometimes meet with in the salivary ducts. The right extremity of the pancreas was very hard, and appeared to be scirrous. No other marks of disease could be discovered in the abdomen, and the contents of the thorax were perfectly found."

DOCTOR CAWLEY's paper contains some experiments on the urine and its residuum; as also, an inquiry into the different theories of the disease, the whole meriting attention by those who wish to obtain every information respecting it. He takes "the proximate cause of Diabetes to consist in a morbid dilatation of the uriniferous tubes of the kidneys (whose office naturally he considers to be merely that of percolation), whereby they become pervious to the nutritious matter, whose globuli, in a state of health, are too large to be admitted through them; and that this morbid state does exist either with or without a diarrhoea thereof." The latter part of this opinion is founded on the information, that, during the first period of the disease, the quantity of urine was not preternaturally increased. This, however, in the present case, cannot be depended upon. See p. 286, 287.

DOCTOR SAMUEL M'CORMICK, *Physician at
Antrim,*

IN DOCTOR DUNCAN'S Medical Commentaries for the years 1783—4, page 349, gives an account of a case of Diabetes which resisted the common astringent medicines; but at length yielded to Dover's powder, in large doses, continued at bed-time. He mentions another case having been cured by the same remedy. Whether these cases were truly the Diabetes Mellitus or not appears to us doubtful. One case is only particularly described, in which the urine is said to have been "almost as limpid as common water, sweetish to the taste, or *rather somewhat of the flavour* of the last liquid he had taken." The urine was not evaporated, nor chemically examined.

MR. PHILIP WERNER, *Surgeon of the British Fac-
tory at Algiers,*

In the *London Medical Journal* for the year 1790, page 221, describes a case of Diabetes, cured by Dover's Powder, and the warm bath. But the urine was never sweet, though in quantity amounting to 10 pints in 24 hours; it was of a reddish white colour, and as thick as milk. His pulse was small and quick, therefore, the disease, as Diabetes Mellitus, cannot be ascertained.

DOCTOR

DOCTOR SHEE, *Physician at Kilkenny.*

In DOCTOR DUNCAN's Annals of Medicine for 1796, page 343, camphor is mentioned as a remedy in Diabetes, and two instances of its efficacy are given ; but whether the disease was the Diabetes Mellitus does not appear to be clearly established.

Extraite d'une Lettre de M. JACQUIN, écrite de Pavie, le 8 Janvier 1791, à M. PELLETIER, sur la Qualité sucrée de l'Urine rendue dans le Diabetes. LA MEDECINE ECLAIRÉE, TOME PREMIER, p. 149.

In this extract M. JACQUIN gives an account of some experiments on the urine of the Diabetes Mellitus, by M. FRANK, with those of DOBSON and CAWLEY : and concludes with these remarks.

“ La qualité sucrée de l'urine des diabétiques cesse d'offrir un phénomène merveilleux si on fait attention que presque toutes les substances alimentaires que nous prenons, comme le pain, le vin, les fruits, les végétaux frais, les legumes, &c. contiennent tous une matière sucrée, qui se combinant avec la lymphe & la gclée animale, se dépose sur-

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tout

tout avec elles dans les chairs des muscles et du tissu cellulaire. On fait en effet que M. Thouvenel a trouvé, dans les chairs des animaux, une substance muqueuse, extractive, soluble dans l'eau et l'esprit-de-vin, qui a une saveur marquée, tandis que la gelée n'en a point. Cette substance se boursouffle sur les charbons, se liquéfie en exhalant une odour acide piquante, semblable à celle du sucre brûlé; elle attire l'humidité de l'air et il se forme une efflorescence saline à sa surface; elle s'aigrit et se pourrit à un air chaud, caractères qui annoncent la présence d'un extrait favonneux et de la matière sucrée.

Si donc, par une surabondance de cette matière sucrée, ou par une déviation particulière, peut-être aussi par un vice quelconque de l'affimilation et de la nutrition, elle se porte en grande quantité aux organes sécrétoires de l'urine, elle peut les relâcher et produire cet écoulement extraordinaire d'urine qu'on observe dans les Diabètes, et qui est fourni par l'excès d'alimens et de boissons que prennent les malades qui en sont affectés. On fait que malgré leur voracité, ils tombent dans un état de colliquation et de fonte de toute l'habitude du corps; ce qui est une nouvelle preuve que leurs pertes ne sont point réparées par la grande quantité d'alimens dont ils font usage.

On voit, par ce qui vient d'être dit, qu'il est impossible de se former une idée juste et précise du
Diabètes,

Diabètes, fans les principes d'une saine chimie, et que fans leur application la nature et le vrai caractère de cette maladie feroient toujours restés dans une obscurité profonde."

DOCTOR FERRIAR,

In his first volume of Medical Histories and Reflections, page 114, gives a short description of a case of the Diabetes, with sweet urine, cured in a short time by a course of bark, with elixir of vitriol. But it is proper here to mention that the same remedies have failed generally in other cases of the disease.

MR. SCOTT, *Surgeon, at Bombay,*

In his letter to SIR JOSEPH BANKS, on the effects of the nitric acid in liver affections, in fever, and in lues venerea, mentions two instances of Diabetes cured by this remedy; but the peculiar nature of the disease is not described.

To these accounts of Diabetes may be subjoined the testimony of Burserius to the good effects of blood-letting, from his own experience; and the recommendation of oily applications to the skin, to prevent aqueous absorption from the air, by Tissot. Besides which, cases of the disease have been met with at Edinburgh, and clinically discussed. In one case the disease was suspended by
opium

opium given to the quantity of 15 grains a-day ; it has been, in others, relieved by the warm bath, and by rubbing the skin with oil, and lard. Every other remedy has been there fully and accurately tried without advantage, at least so far as we have been informed.

SUCH IS THE SUM, of what has been publicly advanced, taught, or otherwise communicated, on the subject of the Diabetes Mellitus, previous to the dispersion of our Notes of Captain Meredith's Case, and which may be recapitulated as follows :

1. That the disease had been referred to a defective state of digestion ; and to a morbid condition of the kidneys : but that the precise nature of either affection had not been sufficiently explained.

2. That immoderate thirst, voracious appetite, and an increased discharge of urine, containing a large proportion of saccharine and other matter, were characteristic symptoms of the disease.

3. That tonics, and stimulants, had in general done harm : that blood-letting, emetics, diaphoretics, narcotics, antispasmodics, alkalies, calcareous substances, warm bathing and rubbing the skin with oil, were the remedies which had been found most beneficial : but that the disease had been generally held incurable.

4. That the blood taken at any period of the disease,

disease, though not sensibly sweet to the taste, except in Dobson's case, yet its serum has had most commonly a wheyish appearance.

5. That dissection had shewn but very slight changes in the natural appearance of the kidneys, which consisted in a mere enlargement of vessels, in a flaccidness of texture, and in a pallidness of colour. In one, they were of the usual size, and nothing preternatural was discovered on laying them open; they appeared to DOCTOR CAWLEY rather paler and softer; but these might have been natural to them, as some varieties are found, in the size, &c. of kidneys in a healthful state.

CHAP. IV.

A general View of the History, Nature and appropriate Treatment of the Diabetes Mellitus.

SECT. I.

Of the History of the Diabetes Mellitus.

THERE is some difficulty in ascertaining the first, and earliest symptoms of this disease; or, that state of it, at which the sweetness and increase of the urine takes place; as the discharge of the urine is generally considered by the patients the necessary effect of the thirst, and quantity of drink, it is thus for a long time often overlooked. Besides, the saccharine taste of the urine is frequently only discovered accidentally. But there is scarcely a doubt, that a previous affection of the stomach takes place before the period, or at the time when the peculiar character of the disease, by the production of saccharine matter is formed, and sensibly shewn in the urine.

In our first case, the bulimia canina preceded,
at

at least six months, the hectic state of the Diabetes, or, so far as recollected, even some months before the increase in the discharge of the urine ; and there was a keenness of appetite for several years. In our second case, there was an indulgence in a great variety of food and drink, connected with circumstances very likely to induce an affection of the stomach ; and when it did take place, was accompanied with so much headach, that the state of the urine was for a long time overlooked. In the communicated cases, morbid affections of the stomach are shewn to have subsisted before the diabetic disease was detected.

However, the history of the previous circumstances, and of the immediate commencement, still require further elucidation ; but when the hectic fever and wasting arrive, the disease has been generally detected, and the history of it from that period accurately detailed.

The most remarkable symptoms are, voraciousness and keenness of appetite, or a frequent craving for food, without the feel of entire satiation ; a parched mouth, with constant spitting of a thick viscid phlegm, of a mawkish, sweetish, or bitterish taste ; intense thirst ; a whitish tongue, with red bright fides ; red and swelled gums, with the teeth feeling as on edge from acids, and loose in their sockets ; headach ; a dry hot skin,

skin, with flushing of the face; a pulse ranging from 80 to 90, but most generally about 84 or 86; an increase of clear urine, of a light straw colour, having a sweetish taste resembling sugar, or rather honey and water; an uneasiness of the stomach and kidneys; a wasting of flesh; a weariness and disinclination to motion, or exertion, with the feeling of weakness; an excoriation, with soreness of the glans penis, and prepuce, which is sometimes swelled; and, as DOCTOR CLEGHORN has expressed in the case of Maclean, “*Coitus nullus. Erigitum nunquam: ne quidem semel rigescit.*” In females there is a peculiar uneasiness about the meatus urinarius. These symptoms continuing, the patient becomes so enfeebled as to be confined to bed; an unremitting febrile state and slight delirium take place, with a removal of the peculiar character of the Diabetes Mellitus: such was the manner of the termination of our second case.

In some instances, the progress is slow, the symptoms remaining stationary, and even sometimes becoming so slight as to induce the patient to suppose himself nearly in health. This state, however, seems to have depended upon the accidental forbearance of those things which aggravate the complaint. In the detail of the treatment of several of the communicated cases, this

this mild degree of the disease may be observed; the complaint was milder, slower, or more rapid in its progress, as the patients adhered to, or deviated from, the regimen. Such changes in degree may possibly depend on other circumstances. See DOCTOR STORER's communication.

In cases of the disease where steadiness and deviations, to and from the diet, alternately occurred, a distressing heat of the stomach with acidity prevailed. The complaint in its progress seems to be much influenced by grief, vexation, or agitation of mind, as they always aggravated the symptoms. The nature of the urine appears to vary at even different periods of the same day, and depends on the quantity and quality of the food, the length of time after eating, and the state of the stomach at the time with regard to activity, which in the more chronic degrees of the disease is variable, as to voraciousness, keenness or craving; while in the acute these are more steady. MR. SHIRREFF's case points out the variations in the nature of the urine at different times, and after eating different substances.

While under the Diabetes Mellitus, the constitution may be attacked with other diseases, which seem to be commonly of an inflammatory nature, and may prove fatal. After the Diabetes has been apparently removed, the body appears to be very susceptible of inflammation. It is said, that the
disease

disease has been suspended during the attack of another complaint.

No age, or constitution seems to be exempted, at least we have cases of it in persons from 12 years and upwards. It often appears in the scrophulous constitution; but it also occurs in other habits. In the former, sequelæ may be sooner, and more certainly formed, which will retard, or entirely prevent the perfect restoration of health. MR. THOMAS's case affords an example where three brothers had the disease; hence probably there may be some peculiar predisposition. Males and females are apparently equally subject to it. It occurs in all classes of people, though probably more generally in the middling and higher orders.

Dissection has shewn a change of appearance pretty uniformly in the mesenteric glands and kidneys; but there are examples where no alteration appeared to have taken place in the former, and very little or none in the latter. The deviation from the natural appearance of the kidneys has consisted merely in an increase of their vascular structure. In DOCTOR CAWLEY's patient, even this hardly deserved notice; but much less so in the important one of MR. THOMAS, and none at all, in the first of DOCTOR PEARSON.

For more particular details of every part of the history we refer to the cases we have recorded.

FROM

FROM what has been just described, the disease surely may be readily distinguished from any other accompanied with a preternatural increase in the quantity of urine; indeed, the name, Diabetes Mellitus, is sufficiently characteristic. In order, however, to remove the most distant possibility of doubt, we shall recapitulate the most remarkable symptoms, which will serve to discriminate the complaint accurately from all others to which it may bear any resemblance.

These are, the discharge of a greater quantity of urine than in health, of an odorous smell, light and transparent, of a straw colour, sweetish taste, and yielding by evaporation saccharine matter; constant thirst; a voracious or keen appetite, or a craving for food; a pulse ranging from 80 to 90, but more commonly about 84 or 86; the degree of heat scarcely more than natural; dry skin, and emaciation.

SECT. II.

Of the Causes and Nature of the Diabetes Mellitus.

THE most common predisposition to this disease, seems to consist in a certain state of the stomach, demanding food of various kinds, often indigestible, and unsuitable for nourishment. This state may depend on some organic formation of the stomach affording a peculiar gastric fluid. The case of the three brothers, mentioned by MR. THOMAS, and DOCTOR STORER's description, where no particular constitution could be assigned, render this idea, however obscure it may appear, at least not improbable. Whatever may be its nature, we know, that with such a condition of the stomach, and opportunities of indulging in fruit, sweetmeats, pickles, in warm stimulating condiments, in wines and fermented liquors; or even in a full participation of farinaceous food, as oatmeal and potatoes, with plenty of small beer, accompanied by great bodily exercise, with or without active mental employment; moisture, grief, vexation, or agitation of mind; sudden variations of temperature; the disease may be, and is actually produced; at any rate these are the circumstances under

under which the disease has been found to have most commonly occurred.

The immediate cause of the Diabetes Mellitus is a morbid condition of the stomach, forming or evolving from vegetable substances saccharine matter, which is quickly separated as a foreign body by the kidneys. But to be more particular; we alledge that this disease consists in an increased morbid action of the stomach with too great a secretion, and an alteration in the quality of the gastric fluid, producing saccharine matter by a decomposition of the vegetable substances taken in with the food, which remains unchanged.

In the diabetic stomach, vegetable matter does not seem to undergo any putrefactive change; but the change appears to be in the evolution of its saccharine matter, after which it does not go beyond the acid state.

From the quantity of saccharine matter apparently separated in this disease, it is possible more than the ordinary quantity of sugar naturally furnished by vegetables is formed, and that there is a sugar-making process going on in the stomach. However, of this we are not satisfied; as in diabetic patients a great quantity of vegetable matter is taken, and the pure sugar in our diabetic urine, could it have been separated from the other matter, would have been probably small. For after the use of animal food, where no sugar was formed,

and when in fact there was none discovered in the urine, there was very little difference in the proportion of animal matter, and such difference would probably have been equal to the quantity of sugar; a quantity certainly not more than the vegetable matter could have furnished. We have seen, however, the disease reproduced, with what we supposed a very sensibly greater quantity of sugar in the urine, than we could believe it was possible to have obtained from so small a proportion of vegetable matter admitted only to have been taken into the stomach; but in this we may have been deceived. Our opinion is supported by the changes in the apparent quantities of sugar contained in the urine at different times after eating various substances, observed by MR. SHIRREFF. The knowledge of the formation and evolution of sugar will derive much illustration from the EXPERIMENTS of MR. CRUICKSHANK; which will also elucidate many of the circumstances regarding the nature and treatment of this disease.

The process of digestion in health may never be unfolded; but its laws may be ascertained, and this is of importance, as in disease there are deviations from them that may be described. In health, an uniform and perfect chyle is prepared, and applied to the salutary purposes of the animal œconomy. In its composition, sugar appears to be an essential article, but it undergoes the proper changes; whereas

whereas in this disease it remains unchanged, producing other morbid affections, besides those on which its undecomposition depends, and is thrown out by the kidneys, as an extraneous and injurious matter.

The voraciousness or keenness of appetite, with the very quick returns of it after eating, mark an increased morbid action of the stomach, which is corroborated by the success not only of our practice, but by any advantage which has been obtained by the remedies of others.

The increased secretion, and altered quality of the gastric fluid, are the necessary consequences of the increased morbid action of the stomach. The opinion, that there is an increased quantity of the gastric fluid, is supported not only by the necessity arising from the increased action of the vessels; but by the rapidity and nature of digestion, and the great quantity of a viscid matter uniformly thrown up by emetics during the continuance of the disease. The alteration of its quality is proved by the same circumstances. Besides, if it be admitted that a dryness of the mouth, bad taste, and the failure of saliva, mark dyspepsia, with a deficiency and vitiation of the gastric fluid; we may with equal propriety alledge, that the mawkish, sourish and sweetish taste which are occasionally imparted, with the viscid quality of the saliva, and

its increased quantity in Diabetes, prove its superabundance and morbid change.

The explanation of the increase in the quantity of the urine refers to the formation of saccharine matter principally ; but we also suppose a sympathetic effect may be attributed from the increased action of the stomach, communicated to the kidneys. Thus, though there were no saccharine matter existing, yet by the increased action of the stomach remaining, a preternatural quantity of urine would continue to be made. Our second case justifies this supposition, which is further supported by considering, that there is an increase of urine, in the inordinate actions of the stomach in other diseases ; and that there is a great diminution of it in scurvy, where little or no action is admitted. The vinous Diabetes gives the increased action of the stomach which is necessary to the Diabetes Mellitus ; but as this depends on a temporary stimulus, it soon ceases ; whereas the other continues, as its stimulus is permanent during the morbid action.

A scarcity of urine of a high colour, and offensive smell, when of some continuance, may denote the stomach of imperfect force ; the common healthy quantity, and usual appearance, the stomach in perfect force ; and a great proportion of urine, the stomach of too much force, or the stomach under morbidly irritable action.

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The increased quantity of urine in the Diabetes has been supposed to be connected with a state of skin favouring absorption from its surface. The lungs have also been imagined to form an extraordinary quantity of water, which was re-absorbed. However, neither the one, or the other, is necessary; as we have hitherto found the quantity of urine to correspond with the quantity of fluid actually drank. But should it be ascertained, that there is really a greater quantity of urine discharged, than of fluids taken in, and that this continued for some time, without any further diminution of the weight of the body, it would become necessary to enquire in what manner such an increase of urine was maintained.

The great quantity of extractive matter, exclusive of the saccharine substance, shews some defect in the powers of assimilation; but as the nature of these are not understood, we cannot attempt any particular explanation. Such defect, however, may be said to depend on the state of the stomach producing the disease, with probably some morbid activity of the lacteal absorbents.

The analysis of healthy urine by MR. CRUICKSHANK, will greatly assist in ascertaining the morbid deviations, particularly in this disease, and in the progressive advances towards recovery. It clearly points out the difference between healthy and diabetic urine. The existence of sugar, and

the great proportion of animal extractive matter, in the latter, shews a remarkable deviation from the former. This analysis must therefore form a standard to be kept constantly in view.

Having referred the immediate cause of the Diabetes Mellitus to an increased action of the stomach, with a vitiation of the gastric fluid, the nature of these becomes a proper object of inquiry.

We take it for granted, that two increased actions of different natures, produce corresponding diseases, distinctly and separately. The one being an increased action with strength, the other an increased action with weakness, and either may probably be the affection of the whole system, or only a part of it. On the accurate distinction of these, rests rational and successful practice. Those actions more precisely appear in diseases with local affection; the first, more generally characterising membranous inflammation, while the latter, being the effect of a specific cause, is of the erythematous kind. But particular organs take on increased actions which appear simple, and only become morbid by their continuance, producing certain organic effects on the organs themselves, or by sympathetic affection with other parts. The lungs, liver, kidneys, and stomach, are liable to be so affected.

In a person whose stomach may be considered to be in perfect force, exposed to active employment, and to varieties of food and drink, who, at the same
time,

time, is naturally inclined to luxurious living, this organ would require additional efforts, and from healthy strong force, an increased morbid action, with vitiated secretion, might arise. This seems to be the manner in which Captain Meredith's disease arose; for he had been entirely employed the three years preceding any particular indisposition, during which he had eat so keenly as to be taken notice of by his brother officers; and for even some years preceding these, although he was less actively employed, yet he eat heartily, but not so as to be remarked.

Again;—In a person with a stomach in perfect force, exposed to much exercise, to fatigue, and other circumstances inducing general debility; but who, during the operation of those circumstances, enjoyed what is stiled good eating and drinking, in other words, high living, it may be imagined some change might be produced in the stomach, which probably would be irregular action, and its consequences. This appears to be the way in which our second case of the disease was induced. The same mode of living would probably, in others, according to the predisposition, have produced gout, or some disease of indirect debility: though we have seen in our first case, that the predisposition to Diabetes may exist with that of gout.

Again;—There may probably be some causes producing a change of the gastric fluid from want
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of action in the stomach, as is supposed in dyspepsia, which would stimulate or irritate, and produce an increased morbid action of the stomach, as well as further secretion and vitiation, giving rise to Diabetes. Such a state of stomach often occurs in gout; but it does not continue so long as to form the other disease. In this manner the disease may originate with the lower class of the people of Scotland, among whom it not unfrequently occurs. They are subject to pyrosis, are accustomed to fatigue, and live chiefly on a diet of oatmeal and potatoes, with very little animal food, perhaps not tasting it above once or twice a week. The hard labour then, to which the common people of Scotland are exposed, in procuring their subsistence, requires a proportional quantity of food, and they generally eat heartily; but the kind of food which they only have in their power to obtain, being chiefly of a vegetable nature, with too little a proportion of animal food, a stomach disease is frequently produced from, probably, the formation of some irritating matter, which acting on the stomach, would produce the peculiarly increased action in the Diabetes Mellitus.

And, again;—In certain constitutions, probably of the scrophulous nature, a long continued indulgence in acids, pickles, sweetmeats, and other articles of a similar kind, especially when accompanied with mental affections, as grief, vexation, or
agitation,

agitation, may produce such a fluid in the stomach might irritate, or stimulate, and thus excite an increased morbid action of the stomach with consequent secretion, and vitiation of the gastric fluid, by which the Diabetes Mellitus would be formed. MR. SHIRREFF and MR. HOUSTON's cases seemed to have arisen in this manner.

Acid and alkaline acrimonies have been, in theoretical systems of medicine, assigned as the foundation of manifold diseases; and although they have, like other theories, been mostly laid aside, except by DOCTOR CULLEN, who has retained a scorbutic acrimony, yet it is extremely probable, some matters possessing these properties, but more commonly that of the acid, are produced by certain conditions of the stomach arising from the nature of the food (as happens to the gastric fluid, which is said to vary according to the diet) habits of life, and general employments, giving rise to those affections depending on a morbid condition of the stomach. Whatever may have been, or can be said, to the contrary on this subject, we now know, that a saccharine substance may be formed or evolved in the stomach, producing general as well as local effects. In the Diabetes Mellitus, the gastric fluid may possess acid properties of a peculiar nature, which may have the power of assimilating vegetable matters to a substance having the nature of sugar. Such assimilations are not unusual

usual in the morbid affections of the animal œconomy, as more especially happens in those proceeding from the application of animal poisons. There is hardly, however, any necessity for this supposition, as the formation of the saccharine matter may be explained, by considering it as evolved, or disengaged from the vegetable matters taken in, by a process in the stomach depending on its morbid state, as well as that of its fluids. Here the saccharine matter, in whatever way formed, remains undecomposed. Our cases justify this opinion, and likewise that such evolution, or disengagement of saccharine matter, and its remaining in a separate state, is owing to the morbid action of the stomach, and vitiation of the gastric fluid. But though the peculiar nature of the change in the qualities of that fluid is not properly understood, yet it may be supposed that acidity is the predominant state of it in the diabetic stomach, while it is not improbable that an alkaline property may be the condition of it in scurvy. Does the present extent of our knowledge with regard to digestion support our reasoning on this subject? It is alledged, that the gastric fluid is the most efficient agent, and that it is furnished by glands, or exhalent vessels; and though its healthful condition has not hitherto been satisfactorily explained, by common, or any chemical examination, yet we may infer from analogy, that a derangement of the glandular structure

ture furnishing the gastric fluid, or if supplied by exhalent vessels, of them, or their ordinary actions, a change may be produced in the fluids they supply. May not the peculiar morbid change of the gastric fluid partly depend on some combination after its separation in the stomach? The theory of glandular secretion, is still a desideratum in physiology. The doctrines of the new chemistry, when properly directed and applied, may lead not only to the explanation of both the healthful and morbid natures of secretion; but also, to the illustration of many other points of physiology and pathology.

In whichever manner the Diabetes Mellitus is produced, as the increased action of the stomach is probably most commonly connected with the effect of a long application of varied stimuli, the nature of the action may be that which is supposed to arise from indirect debility. But the stomach being an extremely sensible organ in its healthful condition, its morbid action assumes that of apparently increased irritability. The action, at any rate, is such, that emetics, narcotics, alkaline and calcareous substances, with animal food solely, are the remedies which have been found decidedly successful. The excessive action of the lacteal absorbents is probably of the same nature, as it arises from stimuli, though it may be connected with sympathetic affection, and even then

then it may be of the same nature as the morbid action with which it is sympathizing.

The certain defect of assimilation which we have stated as forming part of the Diabetes Mellitus, may depend, as we have alledged, on the morbid action of the lacteal absorbents, as well as on that of the stomach. Both act so keenly, though imperfectly, that the matters of digestion are disposed of before the necessary and salutary combination, or conversion of them into proper and perfectly formed chyle, can be effected. Such unassimilated matter, is hurried into the system, and, as an injurious and extraneous body, speedily separated by the kidneys. This explanation refers to the bulimial state of the stomach in Diabetes, which we have seen may continue after the formation of saccharine matter has ceased. On the other hand, it is not improbable, that the bulimial state might be suspended, when the urine would contain sugar with its salts; but no unusual proportion of the animal extractive matter: on the return, however, of the bulimia, the increase of that matter would again occur. This observation remains to be more satisfactorily ascertained; but it may be remarked, that in two cases of the disease, there was said to have been a very short and temporary absence of the bulimial state; but on what it depended did not appear.

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On the whole, therefore, we repeat, that the proximate cause of the Diabetes Mellitus, seems to us to consist in a morbidly increased action of the stomach, with consequent secretion, and vitiation of the gastric fluid, marked by an eagerness of appetite, and acidity. The direct effects of which are the formation, or evolution of saccharine matter, with a certain defect of assimilation, preventing the healthy combinations, and exciting the immediate separation of the imperfectly formed chyle by the kidneys. The more remote consequences will be such changes in the natural structure of the parts, as may prevent the entire restoration of health. That the altered appearances which have been found in the dissections of those who have died of the Diabetes Mellitus, are merely the effects of the disease, and probably only in certain constitutions, is evident from the cases of DOCTOR CAWLEY, and DOCTOR PEARSON, but more remarkably from that of MR. THOMAS.

SECT. III.

Of the appropriate Treatment of the Diabetes Mellitus.

THE principles of the treatment, as established by our cases of the disease, by the view we have given of the proximate cause, and we may further add, by the general success, consist ;

1st. In the prevention of the formation, or evolution of the saccharine matter in the stomach.

2dly. In the removal of the morbidly increased action of the stomach, and in its restoration to a healthful condition.

Whatever may be the cause of the formation of the saccharine matter, it is necessary to prevent it, as on its general stimulus in the system, and particularly on the kidneys, very general affections are maintained. Besides, the means employed to prevent such formation may tend to the removal of the morbid action of the stomach and lacteal absorbents, and the increased and altered state of the gastric fluid, on which its production probably depends. Animal food, and confinement, with an entire abstinence from every kind of vegetable matter, afford the general means ; but which may
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be facilitated by the daily use of alkalies, calcareous and testaceous substances. The quantity of animal food should be restricted, and given in as small quantities as possible to satisfy the stomach: see page 54.

When the urine points out the absence of the saccharine matter, and at the same time its quantity continues more than natural, containing likewise more of the extractive matter in a viscid, or tenaceous form, while the appetite remains keen, it may be presumed that the increased morbid action of the stomach is not removed. It becomes then necessary to exhibit the hepatised ammonia, with an opiate and antimonial at night, and to continue them until the morbid condition of the stomach is removed; the marks of which are, a scarcity and high coloured state of the urine, with turbidness, furnishing on evaporation an offensively smelling and saltish tasted residuum, without tenacity, accompanied with a want of appetite and loathing of food. At this time the tongue and gums will be found to have lost their florid colour, and to have become pallid.

When such a state occurs, exercise is to be enjoined, a gradual return to the use of bread, and those vegetables and drinks which are the least likely to furnish saccharine matter, or to become acid in the stomach, with the occasional use of bitters, &c. Should this period of the disease be overlooked, and

the confinement and animal food rigidly persevered in, scurvy, or something akin to it, might be produced. That such might be the termination of Diabetes, the appearances which arose, more especially in Captain Meredith's case, render extremely probable. The gripings, and offensive stools; the oiliness on the surface, and the high colour of the urine; the foetid breath and saltish taste; the great lassitude and heaviness, with indifference to either eating, drinking, or moving, were strong marks of a state approaching to scurvy.

When the disease has continued long, it may leave local effects, which may prevent the entire restoration of health; the most simple form of which might be supposed to consist in mere dilatation, or enlarged capacity of vessels, as those of the kidneys; or in a habit acquired by long continued action. Our first case shews, that these, when the disease has not been of very long duration, may be soon removed. They may, however, prove one of the circumstances retarding recovery in such a length of disease as that of our second case; but even in this, the kidneys very early partook of apparently their ordinary action. Dissection has shewn some morbid condition or derangement of the mesenteric or lacteal absorbent glands, and some altered appearance of the kidneys. There may also arise some derangement of stomach structure, of pancreas, spleen, liver, and possibly of lungs.

lungs. Such sequelæ would probably be sooner and more certainly formed in scrophulous habits. Whenever they occur, recovery must be retarded, if not finally prevented. They, however, will not interfere with the actual removal of the diabetic disease. We suspected some affection of the mesenteric glands, and of the stomach, in our second case; but we are warranted in alledging, that want of steadiness in the patient solely prevented the complete removal of the complaint. The nature of its sequelæ, or whether they will remain, so as to maintain a state of chronic disease depending on them for its cause, requires still to be determined. Of this determination we must now continue entirely ignorant, as the patient from unsteadiness died, and was not examined after death.

These are the general means of treatment, and they will be found adequate to the most common circumstances of the disease. We think it, however, necessary to particularise certain cases and states of the complaint. The former, are those of short, or long continuance, acute or chronic in degree; the latter comprehend the progress and steps of recovery. It is necessary to attend to these distinctions, as they must direct the remedies and regimen to be employed.

When the disease has been of short duration, an entire use of the animal diet may be immediately pursued, with an abstraction of all vegetable food

and fermented drink which may have been formerly taken. In this state of the disease it may be acute, and then the diet should be spare; blood-letting and blistering may be necessary, with the use of opening and diaphoretic medicines. But when the disease has been of long continuance, especially in persons advanced in years, and whose habits have been luxurious in point of living, it may be proper to regulate the plan of cure by gradually adopting the animal diet: see the case of the Gentleman of 77, page 179, and DR. STORER'S continuation, page 253.

On the removal of the general symptoms, and the return of the urine to a natural condition, which may be ascertained by a comparative examination with the healthy standard of it, as described by MR. CRUICKSHANK, vegetable substances may be cautiously tried. In the selection of which, the preference should be given to those least likely to furnish sugar, or excite disturbance in the stomach. The urine should now be very frequently examined, and on any appearance of a return of the diabetic state of it, the animal diet must be again strictly renewed. In this way the diet must be varied, until we are certain not only of the removal of the disease, but of the disposition to it. In the prosecution of the plan much steadiness and perseverance are required. We have to lament, that our mode of cure is so contrary to the inclinations

inclinations of the sick. Though perfectly aware of the efficacy of the regimen, and the impropriety of deviations, yet they commonly trespass, concealing what they feel as a transgression on themselves. They express a regret, that a medicine could not be discovered, however nauseous, or distasteful, which would supersede the necessity of any restriction in diet.

The vegetable substances we have hitherto found the safest, in the change from the animal diet, are, broccoli, spinage, cauliflower, cabbage, and lettuce. These do not seem to furnish sugar when prudently used in the diabetic stomach, after a proper adoption of the animal diet; but under certain circumstances they have been supposed to produce an acid urine: see the CASES OF MESS. HOUSTON AND THOMAS. When these vegetables have been safely taken, a return to a very small quantity of bread has reproduced the saccharine matter in the urine, and the general symptoms of distress, as thirst, &c. It becomes, therefore, a principal object in the treatment, to vary the articles of diet, so as to gratify the earnest desire of the patient, without bringing on a return of the complaint.

CHAP. V.

Objections to our Doctrine of the DIABETES MELLITUS considered, with a concise Recapitulation of the principal Arguments in its Support.

IT has been asserted, that saccharine matter has not been detected in the blood, or in the stomach; that the disease shews symptoms of dyspepsy; that any stomach affection accompanying the disease may be sympathetic of diseased kidney; and that the kidneys are capable of forming or secreting sugar under a peculiar action, as the breasts of females form this matter copiously.

FIRST OBJECTION: *That saccharine matter has not been detected in the blood, or in the stomach.*

With regard to the detection of saccharine matter in the stomach, many difficulties are in the way, which probably cannot be overcome. For instance, a particular period of the process of digestion after eating is to be ascertained. The entire evolution of the saccharine matter may not be completed until the chyle is ready for the immediate action of the lacteal absorbents, therefore, an emetic might not bring up the necessary contents for correct examination. But the other and most material

material part of the objection respecting the undetection of the saccharine matter in the blood, admits of refutation, which has been pretty satisfactorily accomplished by DOCTOR PEARSON, see the remarks on his third case, page 307 ; and by DOCTOR MARCET, in his thesis, an extract from which we shall insert ; and afterwards proceed to give an account of the experiments we have made on the subject.

“ 1^{mo}. Conclusionem uno positivo experimento probè confirmatam, uno pluribusve negativis experimentis omnino subverti non posse.” *The existence of saccharine matter in diabetic blood has been affirmed by Doctor Dobson.*

“ 2^{do}. Sæpe observatum fuisse in Diabete levissimum accidentalem febrilem paroxysmum, notabilem in qualitatibus urinæ et totius morbi statu, mutationem producere ; ideòque non impossibile esse, diversitates, in variis de sanguine diabetico experimentis observatas, a tali circumstantia non-unquam provenisse.”

“ 3^{io}. Organi gustantis variam sensibilitatem, statum vel conditionem feri quod gustatur, et denique modum in quo experimentum instituitur, multum certè ad præsentiam sacchari plus minusve notabilem faciendam conferre posse.”

“ 4^{to}. Organum gustus quasi certum in chemicis experimentis criterium, nullo modo considerari posse ; cum præsertim, sicut hic contingit,

substantia detegenda cum multis aliis misceatur, quibus ejus sapor facilè occultari possit. Objicietur forsitan eundem saporem facillimè discerni in urinâ diabeticâ quæ varia salia etiam continet; sed innumera exempla ex chemiâ afferri possent, quibus patet eandem substantiam in quodam menstruo solutam, meliùs quam in altero qualitates suas retinere. Ideòque cum urina minus animalis quam sanguis suâ naturâ sit, vel saltem eo aquâ multò dilutior, facilè intelligi potest cur sapor sacchari faciliùs in eâ discerni queat.”

“ 5^{to}. Denique addi potest seri diabetici lentiores putrefactionem, statum sanguinis quasi magis vegetabilem denotando, opinionem saccharum in eodem præsens esse magis probabilem efficere.”
Vid. Tentamen Medicum inaugurale de Diabete, p. 21.
 We recommend the entire perusal of this ingenious thesis.

The serum of Captain Meredith's blood was of a wheyish colour; the serum observed by MR. ABERNETHY was turbid. Captain Meredith's blood, compared under similar circumstances with apparently healthy blood, did not undergo the same changes. The same thing was observed by MR. THOMAS; but neither in his patient or ours, was saccharine matter detected by the taste. We have not yet been so fortunate as to obtain a sufficient quantity of serum for chemical experiment. From the varied appearance and state of the urine in MR.

SHIRREFF'S

SHIRREFF's case, it would appear that even where blood-letting could be readily employed, much attention to the urine after eating would be required to obtain blood containing sugar, as it runs off so quickly by the kidneys.

EXPERIMENTS.

A. About four ounces of the serum of healthy blood, tinged with a little of the red matter, was divided into two equal portions, and introduced into two three ounce vials. In one of the portions was dissolved 10 grains of refined sugar, which did not impart any sensibly sweet taste. Both vials were placed in the same situation, in a temperature ranging from 60 to 70; they were corked three days, and afterwards left open. At this time there was no difference, or change, except a slight turbidness in both. In three days more, the serum without the sugar had an offensive animal smell; but that with the sugar was under a brisk fermentation, and had a vinous smell, which in three days further had a fourish one, while the other was extremely offensive, and ammonia was discovered by the muriatic acid.

B. Five portions of pure serum, measuring each two ounces, were put in five separate vials, and thus arranged; (c) without sugar, (d) with 8 grains of sugar, (e) with 5 grains, (f) with 3 grains, and (g) with half a grain. The vials were left

left open, and placed in the same temperature as in A. On the 9th day the serum in (c) had deposited a slimy matter, and had a slight animal smell; (d) was turbid, with a vinous smell; (e) more turbid and vinous than (d); (f) turbid and fermenting, but had a very strong animal smell; (g) more offensive than (f). On the 15th day the offensive animal smell of (c) was increased, had more deposition, and was of a darker colour; (d) and (e) had a sourish smell, and were turbid; (f) and (g) were extremely offensive.

Note.—The addition of the red matter to serum, appears to render it more quickly susceptible of change. Very small quantities of sugar added to serum, seems to facilitate the putrefactive process.

C. Five grains of refined sugar were dissolved in an ounce of the serum of healthy blood, but it preserved its saline taste, without having any sensible sweetness.

D. Five grains of refined sugar imparted a sensible sweetness to an ounce of water, and a grain of common salt being added, the liquor tasted equally sweet, but sensibly saltish.

E. A drachm of refined sugar was added to two ounces of recent healthy urine, which though it imparted a sweetish taste, yet the pungent saline urinous taste remained.

F. Two drachms of white crystallised sugar were dissolved in an equal quantity of boiling water, and
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while hot about eight ounces of blood was drawn over it in a small stream, from a man's arm, who had a cough. The blood when drawn had its surface frothy, and soon acquired a homogenous appearance. The vessel was placed in the inside of a window, on the outside of which stood a thermometer at 50. On the 2d day, the blood was found separated into its usual portions of crassamentum and serum; the former was more florid than natural; the latter did not taste sensibly sweet. On the 5th no apparent change. On the 7th, the serum had assumed a dark colour; but had no smell. On the 9th, it had an animal smell, and was mouldy. On the 14th, it was so offensive that it was thrown away. In this experiment the sugar should have been dissolved in more water.

G. Two portions of healthy serum were separately coagulated by heat, then agitated with alcohol, and allowed to remain 48 hours, after which they were filtered and evaporated; when the residuums were the same, pungently saline, and being treated with nitrous acid, nothing was formed.

H. To four ounces of healthy serum, 20 grains of refined sugar were added; the solution did not discover any sweetness. The serum was coagulated, then agitated with alcohol, and suffered to remain 48 hours, after which it was filtered and evaporated; the residuum, when re-
saline

duced to about half a drachm, imparted a sweetish saline taste, which, on cooling, formed a very thick syrupy matter weighing about 10 grains, apparently saccharine, and on being treated with the nitrous, yielded oxalic acid.

I. Three ounces of serum, with a drachm of the purest diabetic extract (that of Mr. Shirreff's case) dissolved in it, retained nearly the natural saline taste, without having any sweetness. The whole was coagulated by heat, and then macerated in alcohol 24 hours; afterwards being filtered and evaporated, it yielded a residuum resembling the saccharine extract in colour and taste. This Experiment was made on the suggestion of MR. THOMAS.

K. A portion of the serum of MR. THOMAS's patient, taken 20th Nov. 1797, not exceeding three drachms was coagulated by heat, then treated with alcohol, and allowed to remain 48 hours, afterwards filtered and evaporated; the residuum, amounting in weight to about 5 grains, imparted a sweetish saline taste; but when treated with nitrous acid, nothing was formed. The quantity of serum was too small.

L. Half an ounce of dried healthy blood, from which the serum had been previously separated, treated with two ounces of the common nitrous acid diluted with water, yielded a mass of crystals weighing five drachms, which being re-dissolved
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in hot water; and the oxalic acid when separated by crystallisation weighed 61 grains.

M. Half an ounce of the same blood as in L, was treated in a similar manner with two ounces of pure concentrated nitrous acid, and the oxalic acid obtained was 75 grains.

N. Half an ounce of the dried crassamentum of MR. THOMAS's patient's diabetic blood, (taken in Sept. 1797) from which the serum had been separated, was treated with two ounces of pure concentrated nitrous acid, diluted with $1\frac{1}{2}$ ounce of distilled water; the oxalic acid thus produced, was re-dissolved in distilled water and crystallised; and the crystals when well dried weighed 65 grains.

O. Half an ounce of the same blood as in N, taken in Nov. 1797, from which the serum had been separated, was treated in a similar manner with the common nitrous acid, and the oxalic acid obtained, weighed 31 grains.

P. Two drachms of the same blood as in the Experiments L and M, were treated with four drachms of nitrous acid, and yielded $23\frac{1}{2}$ grains of oxalic acid; to determine the purity, it was dissolved in hot water, and set by to crystallise by cooling; the crystals weighed 11 grains.

Q. Two drachms of Captain Meredith's dried diabetic blood with its serum, drawn the 18th October, 1796, treated with four drachms of nitrous acid, yielded 24 grains of oxalic acid; to determine

mine the purity, this was dissolved as in the former Experiment, and it yielded 14 grains.

R. Half an ounce of dried diabetic blood, left a residuum, after combustion in a strong red heat, weighing $2\frac{3}{4}$ grains, which when digested with muriatic acid lost $2\frac{1}{2}$ grains.

S. Half an ounce of dried healthy blood, left a residuum after combustion of $1\frac{1}{4}$ grains; digested with muriatic acid it lost 1 grain.

T. (a) Half an ounce of the coagulated serum of healthy blood treated with 2 ounces by measure of common nitrous acid diluted with half the bulk of water, yielded 10 grains of oxalic acid.

(b). This experiment was repeated with different, though healthy serum; and the quantity of oxalic acid obtained was 7 grains.

U. (a). Half an ounce of the serum as in T (a), in which 2 grains of sugar had been previously dissolved before its coagulation, treated in a similar manner with nitrous acid, yielded 13 grains of oxalic acid.

(b). This experiment was repeated with the serum as in T (b); but in which 10 grains of sugar had been previously dissolved before the coagulation, and the quantity of oxalic acid obtained was 14 grains.

V. Two patients had a pound of sugar given daily to each, for four days, by DOCTOR WITTMAN; their urine was then evaporated; a portion of the
extractive

extractive matter was treated with nitrous acid, and it yielded nitrate of soda; which being separated, and the liquor farther evaporated, a number of irregular crystals were produced: these precipitated lime water; and a solution of some of them in warm water, rendered lime water milky.

A portion of the extractive matter of the urine of those patients, previous to their taking the sugar, was treated with nitrous acid, and scales were immediately formed, which were found to be the same as those obtained from healthy urine by MR. CRUICKSHANK.

The same patients took sugar a second time, in larger quantity, and for a longer space; but the extractive matter of their urine was found to yield scales immediately.

W. RHUBARB was given, by DOCTOR WITTMAN, to a patient for four days; a portion of blood was then taken from the arm, and the serum was, as well as the urine, evidently tinged with its yellow colour, staining linen.

X. OAK BARK was given in infusion; after some time the urine struck a dark colour with iron; went on becoming darker; then lighter; and at last no change was produced. This was repeated with the same result. ANGUSTURA BARK, often gives a dark colour to the urine without any addition. NITRE can be detected in the urine, as we have ascertained; and so has the OXYGENATED MURIATE

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OF POTASH. MYRRH sensibly impregnates the urine; and so does TURPENTINE and ASPARAGUS. See DOCTOR PEARSON'S *Remarks on his third Case*, page 317. LOGWOOD is said by DOCTOR PERCIVAL to tinge the urine.

THESE EXPERIMENTS were made with accuracy; the chemical part of them by MR. CRUICKSHANK: they admit of the subsequent inferences.

1st. That sugar, and the purest diabetic extract may be contained in the serum of the blood, without being detected by the taste; that with a certain quantity of the former it goes through fermentative changes; and that it is probable, in two or three ounces of diabetic serum from blood taken at a proper time after eating, the saccharine matter might be obtained. See the *Experiments from A to L*.

2d. That a given quantity of dried blood from which the serum had been separated, probably yields, when treated with nitrous acid, a larger quantity of oxalic acid, than an equal quantity of diabetic blood. This result might have been expected; for, as sugar, or certain parts of it, forms a constituent part of an animal body, and not being applied in the Diabetes Mellitus, there must be a waste of it. This is further confirmed by observing that in Experiment N, the proportion of oxalic acid was greater than in Experiment O. In N, the blood was drawn in September, whereas
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in O, it was drawn in the following November; of course, the continuance of the disease occasioned the deficiency found in O. The nitrous acid not being so pure in the one experiment as in the other, might have produced a difference in the result; but which could only have been trifling, as there is only a difference of 14 grains between the two healthy results. *See Experiments from M to Q.*

3dly. That in diabetic blood, dried with its serum, more oxalic acid was obtained, than in healthy blood, from which the serum had been separated; therefore it may be supposed, that the excess in diabetic blood was obtained from the sugar which had been in its serum. *See Experiment Q.*

4thly. That there is probably more iron in diabetic blood than in healthy. *See Experiments R and S.*

5thly. That the serum of blood contains less of the base of oxalic acid than the crassamentum; and that the serum of blood, with the addition of sugar, will be found to contain a proportional increase; therefore, saccharine matter may be detected. *See the first Inference, and Experiments T and U.*

6thly. That certain substances, as sugar, oak bark, nitre, oxygenated muriate of potash, &c. taken into the stomach, may pass off undecomposed by the kidneys, and can be detected in the urine. The stomach, however, in time, seems to acquire the power of decomposing them, which

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may depend, in some cases, on a healthy, and in others on a morbid state. This is a subject in its infancy. See *Experiments V, W, X*.

THE KIDNEYS BEING MERELY SEPARATING ORGANS, removing excrementitious, extraneous, or unassimilated bodies, are very readily acted upon, and speedily remove the injurious matter. It is supposed that the renal vessels receive an eighth of the blood of the whole body at a time. If such be the fact, independently of any peculiar stimulus, it may be conceived how very quickly the serum may lose any sugar, or other extraneous body, it may hold in solution, or otherwise; especially when we consider that the sugar in Diabetes is not constantly supplied, as it depends entirely on the quality and quantity of the food taken into the stomach, which must be interruptedly. We should not probably detect bile in the serum of the blood in jaundice, at least not so sensibly, if the bile was not unceasingly applied by the secretion of the liver. Besides, if arterial blood contains more of the watery part than the renal, the former may lose the greatest part of the superabundance by the kidneys, and with it any extraneous body, as sugar, &c. It seems to be a law of the animal œconomy, that whatever is not assimilated during the process of digestion is carried off by the kidneys, or other outlets, and that very quickly. This is a measure of necessity; for example, were the saccharine

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rine matter allowed to remain disengaged in the blood, and to circulate in the system, it would soon, by the operation of such a stimulus, constantly applied to the heart, &c. destroy the animal. These remarks shew the great difficulty of detecting sugar in diabetic serum.

SECOND OBJECTION: *That the disease often shews symptoms of dyspepsy, or weakness of digestion.*

This objection has been particularly stated by DOCTOR MARCET, and supported by what we have admitted: his words are;

“ *Ammonia hepatifata insigni narcoticâ et sedativâ potestate gaudere videtur; vertiginem scilicet, somnolentiam, nauseam & vomitum inducens, atque cordis et arteriarum actionem minuens. Hinc DOCTOR ROLLO probabile esse putat, hoc remedium, eodem modo quo opium, in hoc morbo prodesse, actionem nempe ventriculi, & totius systematis energiam, minuendo. Sed hæc opinio, quæ appetitûs auctione precipuè nititur, validissimis objectionibus obnoxia mihi videtur. Quomodo, verbi gratiâ, hæc suppositione, explanare possent notabilia signa dyspepsiæ et debilitate digestionis quæ in Diabete sæpe occurrunt, et quæ, ut ipse auctor commemorat (*Notes on a diabetic case, p. 9.*); talia interdum sunt, ut æger post plures dies alimenta immutata & indigesta evomat? Et præterea, cum generalia debilitatis signa morbum semper comitentur, cumque astringentia & tonica, præ omni-*

bus aliis remediis, in eo utilia reperiuntur, probabilissimum mihi videtur, morbidam conditionem ventriculi, ab auctâ hujus organi actione non pendere, sed illius morbidæ actionis naturam adhuc ignorari, ideoque utilitatem sedantium remediorum, aliâ quâdam causa, potius explanari debere." See *Thesis*, page 38.

In *Captain Meredith's* case, as described in the first edition of this work, page 18, and in this, page 29, it is said, "that he had thrown up some apple-pye, which he had secretly eaten three days before. The apples and crust had not apparently undergone the slightest alteration. This we have seen, with the account of the six months preceding the attack of the disease, has been urged against the idea of an increased action of the stomach. Remarks are made on the same circumstances by ourselves in a few pages afterwards, which have probably been overlooked; but as they contain an answer to DOCTOR MARCET, we shall here re-insert them. See page 22 of the notes of *Captain Meredith's* case, page 25 of the first, and page 34 of the present edition. "We would on the whole say, that the cause of our diabetic disease, very probably, consisted in too great an action of a morbid kind of the muscular fibres of the stomach, with the secretion of too great a quantity of the gastric fluid, and some alteration in its quality, producing with substances capable of forming it
 saccharine

saccharine matter, and a certain defect in the powers of assimilation ; probably depending also in part on too active a state of the lacteal absorbents. With this opinion we do not suppose the circumstance of food being thrown up unaltered interferes, as the great quantity so frequently eaten, prevented the stomach from getting quit of all its contents unchanged, especially as it would no doubt act in preference on those matters suiting its peculiar morbid condition. *A species of indigestion, however, might be allowed, as in this disease we suppose digestion to be totally changed, from the results of the peculiar process of the stomach being so entirely different from what usually occurs. For though the action of the stomach is increased, yet being morbidly so, the salutary products are neither formed nor applied."*

We have said, that the increased action of the diabetic stomach is an action connected with debility ; being irregular and imperfect, it does not accomplish digestion. Digestion, therefore, we allow is incomplete, and unnaturally performed in the Diabetes Mellitus—it is peculiar ; though the powers employed appear extremely keen and active, yet they are very defective, and do not perform their salutary purposes. Had we alledged that the powers of the stomach continued the same as in health, being simply increased, an objection might have been started, as complete and salutary diges-

tion ought not only to have taken place, but speedily. We have, however, considered THE ACTION OF THE STOMACH IN THE DIABETES MELLITUS, AS MORBIDLY INCREASED, AND INCAPABLE OF PERFECT DIGESTION.

“Anorexy, as depending on dyspepsy, has been alledged to consist in a diminution of the muscular action of the stomach, in a vitiated state of the gastric liquor, or in a deficiency of it. In anorexy, remedies weakening the tone of the stomach, or system in general, always increase the disease; the most successful treatment (at least this is the general opinion) being by remedies giving tone, and action to the stomach. In our disease, a keenness of appetite to voraciousness has always attended, except during the mere temporary disgust arising from absolute accumulation; and the changes for the better have been by those remedies which diminish the action of the system in general, and of the stomach in particular, as was shewn by the effects of confinement, blood-letting, emetics, and hepatised ammonia.” The case treated by DOCTOR HUCK SAUNDERS, (*See page 306.*) as well as others, shew the inefficacy of tonics and astringents; indeed, we may say they generally do harm. The cases of DOCTOR CLEGHORN and MR. THOMAS, shew a state of system in this disease, very different from that indicating the use of such remedies.

THIRD OBJECTION : *That the stomach affection may be sympathetic of diseased kidney, from the intimate consent subsisting between them both.*

That stomach affections are produced in consequence of primary morbid conditions of the kidneys there is no doubt ; but those which exist in the Diabetes Mellitus are entirely different. Besides, in most of the cases of this disease which have come under our examination, they have been either preceded by stomach derangement, or have been produced by causes immediately operating on the stomach.

The stomach affection attending primary diseases of the kidneys are accompanied with vomiting, especially after eating ; they are often anorexial ; and, in general, the appetite is not good. The sensible heat of the body is greater ; the pulse is also much more frequent, being from 100 and upwards ; whereas in the Diabetes Mellitus it very seldom exceeds 84, is permanent, and regular. This is a circumstance which has not been particularly attended to as a distinctive mark of disease. Local affection, or derangement of any organ, is generally accompanied with an accelerated pulse, ranging from 90 and upwards ; which may ultimately become the pulse of Diabetes in advanced states of the disease, where local affections, as sequelæ, may have been formed. We have met with one case of a soldier in the Royal Artillery, which

is so illustrative of the difference between symptomatic stomach disease depending on kidney affection, when compared with what happens in the Diabetes Mellitus, that we shall insert it. The case was drawn up by DOCTOR MACCULLOCH, of the *Artillery*.

“ *George Higson*; age 21; brown hair; by trade a weaver. About five years ago he received a blow on the left side from a fall; since which time has been occasionally subject to pain on that side, which extends to the back, occupying the lumbar region, is sharp and shooting, and is increased by respiration. He is unable to lay on the affected side. He has no cough, but has almost a constant nausea, with frequent vomiting. He has a pain, with a sense of numbness in both thighs, but more particularly in the left. He has occasional headaches; has a constant thirst; tongue is clear; what he eats is most commonly thrown up directly; belly regular; sleeps pretty well. He is subject to irregular fits of shivering, which are of very short duration. His pulse is much accelerated, ranging generally from 100 to 120. His urine is increased in quantity, amounting to six quarts in the day; is pale and clear; four pints being evaporated, a brownish saline residuum remained, containing very little extractive matter, not amounting to six drachms; a portion of which being treated with nitrous acid, exhibited a slight appearance

pearance of scales ; but the quantity of extractive matter was too small to have obtained any regular crystals."

The resemblances to the Diabetes Mellitus, in this case, are the quantity and colour of the urine, and the thirst ; the differences are in the urine not being sensibly sweet to the taste, with the result of the evaporation and chemical trials ; the nausea and vomiting ; the pain ; the numbness of the thighs, and the quick pulse. Contrasting the whole case with *Captain Meredith's*, a very succinct distinction between a Diabetes depending on kidney derangement and a stomach affection is conveyed, and characteristic marks are determined.

We have been so fortunate as to meet with another case, by the liberal recommendation of an eminent Physician in London, on the 15th July, 1798.

James Crush ; age 30 ; a farmer ; for several years has been subject to what he terms a weakness of the kidneys, from, as he supposes, the custom of drinking freely of malt liquors. About Christmas last, he had a fall from his horse ; since then has been affected with his present complaints, which are, a constant sensation of weariness, or uneasiness in the region of the kidneys, extending forwards to the stomach ; a loss of appetite ; great thirst ; dry
skin,

skin, and voids at least 14 pints of urine in 24 hours, which is of a clear colour, slightly urinous smell, and insipid taste, but yields on evaporation a pungent saline mass, having much less extractive or animal matter than in health; pulse 120 (which was found to be the same on the examination the day before). He complains of a painful and gnawing sensation in the right leg, occupying the tibia. There is a little swelling or puffing of the limb towards the ancle. After the accident, he was for a considerable time sick at the stomach, vomiting after his food; but lately his stomach has been more retentive. He had used a variety of medicines without any effect; and was once put on the animal food fourteen days, by a medical gentleman at Hertford, but without any advantage.

Those cases are instances of, probably, what has been termed the *DIABETES INSIPIDUS*. The second case was, as such, more distinctly marked, the urine being perfectly insipid, and in great quantity; the dependance of which on a morbid affection of the kidneys appeared very evident, and differed from the symptoms in *Diabetes Mellitus*, by the want of appetite, the nausea and vomiting, the frequency of pulse, and the state of the urine. The kidney affection was pointed out by the previous weakness of the loins, by the fall, and its immediate consequences.

FOURTH OBJECTION: *That the kidneys are capable of forming or secreting saccharine matter under a peculiar action. The breasts of women form this matter copiously.*

It has been already observed, that the kidneys are separating, and not secreting organs—their natural function being to separate excrementitious, saline or other extraneous matters from the blood; they have no peculiar secretion. The breasts separate or secrete a milky fluid from the blood, the saccharine matter contained in which has a chemical difference from common sugar, and is not the same as that separated by the kidneys in the Diabetes Mellitus. But in order to ascertain how far the saccharine matter produced in Diabetes resembled that secreted in the breasts of animals, the following experiments were made by Mr. CRUICKSHANK.

“ Two drachms of crystalized sugar of milk were treated with 12 drachms of the concentrated nitrous acid, diluted with about an ounce of water; after proper evaporation, the liquor was suffered to cool, when a mass of crystals, mixed with a white powder, were deposited; these being separated, and dried on blotting paper, amounted to 58 grains; about six drachms of hot distilled water were then added, upon which the crystals, consisting of oxalic acid, were dissolved, and the white powder fell to the bottom; the clear liquor being
decanted,

decanted, the remainder was thrown into a filter, and by this means the powder obtained in a separate state, which, when dried on blotting paper, amounted to 10 grains nearly. This was found to have all the properties of the saccholactic acid, as described by SCHEELE.

“Two drachms of very sweet extract from diabetic urine were taken, and treated at the same time with an equal quantity of nitrous acid, and under exactly similar circumstances. The liquor in this case, when properly evaporated, deposited a quantity of very transparent crystals, but no white powder; these, when properly dried on blotting paper, weighed 40 grains very nearly, and, on the addition of six drachms of hot distilled water, were entirely dissolved.

“The same experiment was repeated with two drachms of the saccharine matter, obtained from the urine of MR. GERARD’s patient, *Clark*; in this instance, the usual quantity of oxalic acid was procured, but not the least trace of saccholactic acid.

“A similar trial was made with the sweet extractive matter from the urine of DOCTOR PEARSON’s patient, Case 3. This afforded 50 grains of oxalic acid, but the crystals were not so transparent as those in the former experiments. On the addition, however, of six drachms of hot distilled water, the whole was dissolved, except a few globules

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of a fatty like matter (similar to those met with on digesting animal substances in dilute nitrous acid) but these had neither the properties nor appearance of saccholactic acid.

“ As the extractive matter obtained from diabetic urine has been supposed to resemble honey, which may, in some degree, be considered as an animal sugar, it was thought necessary to subject this substance to a similar process, with a view of ascertaining whether or not it contained the basis or radical of the saccholactic acid. Half an ounce of honey was accordingly treated with three ounces of nitrous acid in the usual manner, and it yielded about two drachms of pure oxalic acid, but there was not the least appearance of saccholactic acid; honey, therefore differs essentially from the sugar of milk; and, indeed, from most of its obvious properties, would appear to be merely a modification of common sugar.

“ In the course of these experiments, I found that two drachms of pretty dry and sweet diabetic extract, yielded, with 12 drachms of the nitrous acid, from 40 to 50 grains of crystalized oxalic acid, being nearly the proportion which may be procured from an equal quantity of common sugar, if we make an allowance for the water and saline substances.

“ Upon the whole, therefore, it would appear that this sweet extractive matter does not contain the
basis

basis of the saccholactic acid, a circumstance which sufficiently distinguishes it from the saccharine part of the milk of animals ; and seems to shew, that it is nothing more than vegetable sugar, if we may be allowed the expression, mixed with a greater or less proportion of animal mucilage."

The apparatus provided for the secretion of bile is elaborate, as is that for the secretion of any peculiar fluid, or matter, not previously subsisting separately in the blood. The structure of the kidney, being intended to perform a separation of excrementitious or extraneous matter from the blood, is simple, consisting merely in small and minute vessels, which partly open themselves into a basin, separating a fluid, from whence it is directly conveyed to the bladder, and from thence discharged out of the body. What morbid derangement could possibly take place in this structure, so as that it could form sugar ? Suppose the blood arrived at the renal artery in Diabetes Mellitus, it must move on rapidly through its ramifications to their terminations in the pelvis of the kidney, and separate the urine ; but we alledge, that no change of action in the renal artery, or its ramifications in the kidney, could, without a complete change of structure, possibly form sugar. We, therefore, hold it impossible for any change of action in the vessels of the kidneys to be capable of forming sugar from the blood. But, suppose the structure of
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the kidneys were so completely changed, as that in place of a mere continuance and ramification of vessels, there were interruptions by the formation of a sort of cellular texture, we might then imagine such combinations could take place, as produce the characters of the urine peculiar to the Diabetes Mellitus. However, nothing like this derangement of structure has been shewn. Dissection hitherto has only exhibited the following deviations from the natural state; an enlargement of the kidneys; a softness of substance, and a pallidness of colour. No appearance has been shewn either in them, the stomach and its appendages, the lacteals and their glands, but what may be referable to the effect of the disease, except in the appearance of the mesenteric glands, which may be peculiar to the scrophulous constitution. MR. THOMAS's case gave no morbid alteration of structure any where; even although the disease had been of about 12 months duration. DOCTOR PEARSON's first case shewed no change in the condition of the kidneys; nor did that of DOCTOR CAWLEY shew any thing except a slight increase of vascularity. From our view of the nature of the disease, we should expect, that where it has been of very short duration, terminating by the succession of some other disease, or by an accidental injury proving fatal, dissection would shew no derangement of parts whatever, unless, as we have just observed,

observed, in a scrophulous habit, the mesenteric glands, &c. might be found enlarged. The enlargement of the kidney is not peculiar to the Diabetes Mellitus; and that it may arise from simply increased action, or necessity, is explained by MORGAGNI in his XLth Letter, Art. 14 and 15—and XLVIII. Art 16; where he points out, that dissection frequently shews one kidney very much enlarged, when the other is wasted, or otherwise prevented from performing its functions by disease; and that where there is naturally only one kidney, it is generally of the size of two, or even larger. In these cases the urine is supposed to have been separated in a healthy state.

A Soldier of the West Kent Militia had obtained a furlough, and in his way home he found himself, when he got as far as Shooters' Hill, incapable of proceeding farther. He was received into the Royal Artillery Hospital at Woolwich, when he was found to be affected with a peculiar kind of delirium, and could give no distinct account of his complaints. He soon, however, became somewhat more recollected, and said that he had been frequently sick at the stomach, especially after eating; had been loose in the belly, but was now costive; had a swimming of his head; a difficulty in passing urine; and was not sensible of particular uneasiness, but complained of a general soreness. He died in ten days, two or three days previous to which, the delirium

was

was more remarkable, the stomach became more irritable, and he voided no urine: The catheter was introduced into the bladder; but no urine escaped. Opium gave some relief. On opening the abdomen, the viscera were found in their natural situation. The omentum was destitute of fat, its blood vessels appeared more turgid than natural. The transverse arch of the colon was much contracted, but shewed externally no appearance of disease. The small intestines, in some parts, looked redder than natural; the fæces contained in them, and in the large intestines, were fluid. There was no appearance of disease about the stomach. The kidney on the right side was much enlarged, having the appearance of a bag distended with water; the corresponding ureter did not seem larger than usual—this kidney being removed, and a section made through its exterior and convex surface, a quantity of urine issued, amounting to 10 or 12 ounces; the natural structure of the organ seemed to be obliterated, except in the superior and posterior parts, the rest resembling a bag about $\frac{1}{2}$ of an inch in thickness, divided by a number of partitions; in the pelvis was found a calculus, weighing 100 grains, with two small stones; and another of a very considerable size was found in one of the infundibula, having the appearance of a trunk with two branches. The left kidney was much larger than usual, containing

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about

about three or four ounces of urine, but the natural structure did not appear to be destroyed; in the pelvis was found a small calculus of the size of a common pea, a large one occupied the mouth of the ureter, and about half an inch lower was a much larger one of an oval form, completely filling the cavity, which was distended, and had marks of inflammation; but the ureter below this place was of the natural size. The bladder was much contracted. A considerable quantity of fluid was found between the dura and pia matter, and also between the laminae of the latter. In the left hemisphere of the brain, the blood vessels seemed more turgid than natural. The ventricles also contained more fluid; and on removing the cerebrum and cerebellum, there were found at the basis of the skull from two to three ounces of water, the greatest part of which had probably escaped from the ventricles.

A Child of five years of age died with a distended belly, and great emaciation. On opening the abdomen, there issued a quantity of a straw coloured fluid, which was not, however, the cause of the distension; for behind the mesentery, and towards the right side, a large tumour pushing the intestines forward was observed, being seven inches in diameter from the stomach downwards, eight inches across, and five in depth; upon the surface of which the mesentery and mesenteric glands, somewhat

somewhat enlarged, were perceived; on making an incision into it, there were found several substances of different consistences and appearances, part thin and transparent, resembling urine, part like pus, and some coagulated blood mixed with pus; there was also another substance in considerable quantity, which very much resembled fat, but somewhat softer. On a further examination of the nature and situation of this singular tumour, it was found to be the right kidney, diseased and distended to this enormous size. The ureter on this side could not be traced. The left kidney appeared sound, although enlarged. The liver contained several tumours of a whitish appearance, which, when cut into, resembled the fatty matter already described in the kidney. On the surface of the right lung there was observed a substance of a fatty nature, resembling that already mentioned, and attached to it by a small neck; there were several smaller tumours of a similar nature on the same lung. *Note.* Two children of the same family died before this child, with similar complaints, and about the same age; but they had not been examined after death.

There is a case described by MR. PEARSON, of Doncaster, in the Medical Observations and Inquiries, vol. 6, p. 236, in which a kidney was found somewhat similar to the preceding.

In the first volume of the Medical Communica-

tions, page 127, DOCTOR KEIR, late Physician to St. Thomas's Hospital, relates the case of a woman who died of vomiting, which was found on dissection to have arisen from a morbid affection of the left kidney, with a considerable enlargement of the right one. He mentions vomiting as an uniform sympathetic effect of morbid states of the kidneys.

HAVING thus endeavoured to obviate the most material objections which have been urged against our doctrine of the Diabetes Mellitus, we shall concisely state the principal arguments in support of it. These consist in,

1st. The fact, that a stomach affection generally precedes the urinary characteristic symptoms of the disease.

2dly. The fact, that a stomach affection always attends the disease, which materially differs from that, sympathetic of primary kidney affection.

3dly. The fact, that a diet of animal food, with an entire abstinence from vegetable, or other matter capable of forming sugar in the stomach, removes speedily the general symptoms, the saccharine matter, the quantity of the urine, and its unnatural state.

4thly. The fact, that dissection has shewn no morbid condition of the kidneys, but what may be referable to a continuance of increased action from the application of a simple stimulus, and probably

bably sympathy, augmenting merely the capacity of their vessels. The first case of DOCTOR PEARSON, and the case of MR. THOMAS, exhibited no disease of the kidneys whatever.

For a particular illustration of these facts, we refer to the cases and communications; to the general view we have given of the history, causes, and treatment of the disease, and to the consideration of the objections.

On the third fact, however, we shall here briefly observe, that on the supposition of the kidneys forming sugar, the formation ought to continue so long as the blood retained any of its constituent parts. But this is not the case, for the entire cessation of the saccharine matter takes place in the urine, by the use of the animal food, in a very short time, probably in less than 48 hours; whereas, in the secretion of milk, which contains a kind of sugar, it is alledged, that it will continue, and with the same proportion of sugar on animal food. See DOCTOR PEARSON'S remarks on his third case; but see also MR. CRUICKSHANK'S Experiments, page 320, which shews the difference between the sugar of milk and that of Diabetes.

CHAP. VI.

Experiments on Urine and Sugar by
MR. CRUICKSHANK.

SECT. I.

Experiments on Urine.

THE urine is a fluid separated from the blood by the kidneys, containing several neutral salts, with more or less animal extractive matter. The relative proportions of these substances are found to vary so much in the same person, both in health and disease, that it is extremely difficult to fix on what may be considered as a standard for healthy urine.

The specific gravity of this fluid reaches from 1005 to 1033, that of distilled water being 1000; by exposure to the air, it soon runs into the putrefactive state, accompanied with the production of much ammonia, although when first voided, it always contains an excess of phosphoric acid, and reddens litmus; in consequence of this excess it holds

holds in solution more or less phosphate of lime, which may be readily thrown down by a fixed alkali, or even pure ammonia.

By evaporation, 36 oz. yield a residuum, varying from 1 oz. to $1\frac{1}{2}$; this consists of the muriates of potash and soda, the phosphats of soda, lime, and ammonia, the phosphoric and lithic acids, with animal extractive matter. Their relative proportions in a healthy state may be nearly as follows :

	Oz.	Dr.	Gr.
Muriatic salts.	0	1	0
Phosphoric salts.	0	3	50
Lithic acid and phosphate of lime, with excess of acid.	0	0	25
Animal extractive matter.	0	3	40

The neutral salts, when purified by crystallization are generally very fusible, but this circumstance varies much, according to the greater or less proportion of phosphoric salts, more particularly the phosphate of ammonia, on which their fusibility in a great measure depends : instead of melting, this saline matter sometimes decrepitates when suddenly heated, owing to an excess of the muriatic salts ; of these last it may be observed, that the muriate of potash is in general the most prevalent, and is easily distinguished from the muriate of soda, by its crystallizing in some degree by cooling, and by its

affording cream of tartar on the addition of acid of tartar.

In recent urine the ammonial salts bear a very small proportion; but when it has become stale or putrid, they are much more abundant. The phosphate of ammonia is the principal, although we have likewise met with the muriate of ammonia.

The lithic acid and phosphate of lime are generally deposited, at least in a great measure, after the urine has become cold, and stood for some time; the quantity of the first varies exceedingly, but that of the last we have found, for the most part, nearly the same, the proportion being about one grain to two ounces.

These substances may be easily distinguished, by dissolving them in twice their weight of nitrous acid, diluted with a little water, and evaporating to dryness; the dry mass when hot will assume a beautiful deep rose or crimson colour, when the lithic acid is present, but will continue white if heated even to redness, or have only a slightly greenish tinge when there is nothing but phosphate of lime. Their relative proportions may be ascertained by exposing the mixed mass for some time to a red heat in a crucible; in which case, the lithic acid will either burn out or evaporate, leaving the phosphate in a pure state.

The quantity of extractive matter is more variable than that of any other substance; hysterical, or
crude

crude urine, (as it has been called) containing hardly any, while that of concoction abounds with it.

This matter yields, by distillation, water containing the carbonate of ammonia; this carbonate in a concrete state; a foetid empyreumatic oil; a little phosphorus, and, lastly, a residuum of animal coal difficult to incinerate; in short, nothing more than the usual products from animal substances.

If to an ounce of this extract, be added an ounce of the concentrated nitrous acid, diluted with an equal quantity of water, a violent effervescence, accompanied with heat, and the disengagement of nitrous gas will take place; when the action has ceased, and the liquor become cold, a number of shining scales, or crystals, resembling the acid of borax, will be deposited, which, when well dried on blotting paper, will be found to weigh from 5 to 7 drachms, or sometimes more, the proportion varying according to the quality of the extract, and the method of conducting the process.

The figure of these scales appears to be that of flat rhomboids; they have a smooth greasy feel when pressed between the fingers; are soluble in much greater quantity in hot, than cold water, and also in some degree in alcohol; although repeatedly washed with this fluid, and dried on blotting paper, they still retain acid properties, and strongly redden the syrup of violets; they are readily taken

up

up by the sulphuric and muriatic acids without commotion; but with the nitrous acid, they produce a kind of effervescence, and appear to be in some measure decomposed; they combine with the mild alkalies with effervescence, and form very soluble neutral salts, whose properties have not been sufficiently examined. Their solution in water does not precipitate lime water, nor the muriates of lime or barytes, nor the nitrates of silver or mercury, in any sensible degree, nor has it any effect upon the sulphate of iron or acetite of lead; they do not, therefore, contain phosphoric or oxalic acid; when thrown upon a red hot iron, they melt and evaporate in white smoke, leaving a very small quantity of a charry residuum, by no means difficult to incinerate; but when exposed to an intense heat, they burn with a reddish flame, and a kind of detonation somewhat similar to the nitrate of ammonia.

From these experiments it would appear, that this substance is an animal acid hitherto unknown, and whose basis exists in this extractive matter.

We shall now briefly mention the effects produced by certain reagents on the urine, when in a healthy state, and likewise when altered by some morbid conditions of the body.

Pure ammonia, and the fixed alkalies, dropped into healthy recent urine, produce a slight cloud, which on examination will be found to consist principally

cipally of phosphate of lime; about two grains may be obtained in this way from four ounces of urine. Lime water, likewise, throws down a precipitate which is much more copious, for reasons that must be obvious.

Nitrous acid, added to healthy urine, produces a slight effervescence. and gives it more or less of a reddish colour, but produces no precipitation. In some diseases, however, particularly general dropsy or anasarca, this reagent when dropped into the urine, produces a milkiness, and in some instances a coagulation, similar to what would take place, if added to the serum of the blood. When bile is mixed with this fluid, as in jaundice, the acid renders it green; a similar effect is produced by the muriatic, and also in some degree by the sulphuric acids; for this purpose, however, the muriatic is to be preferred.

The principle of tan, or infusion of oak bark, detects animal mucilage or jelly, and the quantity of coagulum thrown down will in general bear a certain proportion to the extractive matter. Four ounces of healthy urine afford in this way a precipitate of about four grains*.

The corrosive muriate of mercury is a very useful reagent, as it has no immediate effect upon recent

* SEGUIN remarks that in every case where the action of the stomach and organs of digestion are much impaired, this infusion produces a copious precipitate.

cent healthy urine, but in every case of increased action of vessels, more particularly of the inflammatory kind, a greater or less milkiness and a whitish precipitate is instantly produced; it likewise in some degree coagulates dropfical urine.

Effects somewhat similar, although not so striking, are produced by alum.

The muriate of barytes detects the phosphoric salts. Four ounces of healthy urine yield with this reagent a precipitate of 13 grains, equivalent to about 24 or 25 grains of microcosmic salt, consisting of such a mixture of the phosphates of soda, and ammonia, as are usually met with in the urine. This substance will therefore shew when these salts are deficient or in too great quantity. The sulphate of iron has a similar effect, but is not so certain, as any little excess of acid might prevent the separation of the phosphate of iron.

The nitrates of mercury and silver are decomposed by the phosphoric and muriatic salts, and likewise, in some degree, by the extractive matter; they can therefore be but of little use as reagents.

The acetite of lead is decomposed by the muriatic and phosphoric salts; with the last it forms an insoluble precipitate, but the muriate of lead may be dissolved by 18 or 20 times its weight of hot water. This circumstance affords a ready method of determining their relative proportions;
for

for if we precipitate a given quantity of urine by this substance, dry the precipitate, and then digest it in 20 times its weight of distilled water, what remains must be phosphate of lead, and the quantity taken up will indicate the proportion of muriate of lead. Four ounces of healthy urine treated in this way, yielded a precipitate of 31 grains; this being digested in distilled water, 7 grains were taken up, the remaining 24 grains were found to be phosphate of lead, equivalent to 23 or 24 grains of microcosmic salt, as was determined directly by experiment.

It must be observed, that the urine employed in these trials should be recent, and not kept for any length of time, as it is well known that ammonia is soon produced, which would render the results extremely uncertain. It was thought proper to give the quantity of precipitate thrown down by the principal reagents, when added to healthy urine, for by this means we shall be better enabled to detect any remarkable deviation from the healthy standard. The quantity of four ounces was conceived to be the most convenient, as in many cases we might not be able to procure more, and a less quantity could only afford uncertain results.

Upon the whole, therefore, we would observe, that the proportion of extractive matter may, in some measure, be determined by an infusion of oak bark, or rather galls. The quantity of phosphoric salts by the muriate of barytes, or acetite of lead;

lead; that of the muriatic salts by the latter substance; the proportion of phosphate of lime by pure ammonia, or any of the alkalies, and the lithic acid by the process described, p. 440.

In morbid states of the urine, the coagulable part of the serum is detected by the nitrous acid, and even by heat; bile by the nitrous or muriatic acids; and the condition of urine accompanying rheumatism and other inflammatory complaints by the corrosive muriate of mercury, and sometimes by alum. With regard to sugar which is met with in Diabetes, the different methods of detecting it have been already fully explained; we would only further propose, when the quantity of saccharine matter is but small, that the extract obtained by careful evaporation should be treated with twice its weight of nitrous acid, and the whole reduced by evaporation to a very small compass; when this has become cold, the crystals formed should be carefully examined; if we perceive nothing but small cubes or rhomboids, we may be certain that no oxalic acid has been produced; but if along with these we should observe slender needles or prisms, these should be carefully separated, dried on blotting paper, and thrown into lime water; if a precipitation is occasioned, it must either be from phosphoric or oxalic acid, and from which may, in a great measure, be determined by the appearance of the precipitate; if this has the resemblance of flocks, and subsides slowly, the phosphoric acid is the

the precipitant; but if it has a powdery form, and subsides quickly, it must be produced by oxalic acid. To this mode we know it may be objected, that all animal substances yield more or less oxalic acid, but this is by no means true to the extent generally supposed, for there are several animal substances, and the extractive matter of healthy urine is one, from which we have never been able to procure any sensible quantity of this acid; of the different parts of the blood, the coagulating lymph is the only one which yields it in any remarkable proportion; and we believe that the coagulable part of the serum, when perfectly pure, does not afford it at all. We shall only further remark, that the method by fermentation, so much relied upon by some, is by no means correct, as will afterwards appear.

From what has been delivered it must be evident, that an attentive examination of the urine may lead to useful conclusions in several diseases.

In dropsy the general disease may readily be distinguished from that depending on morbid viscera, by attending to the effects produced on this fluid by nitrous acid, and the corrosive muriate of mercury. In three cases which we have lately met with, the urine coagulated not only on the addition of nitrous acid, but likewise by heat; and in one of them, which proved fatal in six weeks, the urine at one time appeared to differ but little from
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the serum of the blood, so remarkable was the coagulation produced both by heat and acids. This coagulable state, however, must not be confounded with that produced by cantharides, for we have seen some cases of violent strangury from this cause, where the urine had the appearance of a mass of hydatids*.

In the dropsy proceeding from diseased liver and other morbid viscera, the urine does not coagulate either by the nitrous acid or heat; it is usually small in quantity, high coloured, and deposits, after standing, a considerable quantity of a pink coloured sediment; this peculiar sediment we consider as, in some measure, characteristic of diseased, or rather scirrhus liver. On examination, we found that it consisted of phosphate of lime, some animal matter, to which its red colour was probably owing, and a little lithic acid; this last, however, was in very small quantity.

In inflammatory affections, particularly those of the chest and acute rheumatism, the urine, during the active state of the disease, always affords an immediate precipitate with the corrosive muriate of mercury or alum, and sometimes also with the nitrous acid; when the disease takes a favourable turn, this effect will in a great measure cease, and the lateritious sediment make its appearance.

In fevers, particularly such as are accompanied with a strong action of vessels, similar phenomena
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* The infusion of galls likewise coagulates this species of urine.

may be observed ; but in this case the lateritious sediment, which never fails to make its appearance at the crisis, or abatement of the disease, is much more remarkable and constant ; and the nitrous acid, when added to the urine before the deposition takes place, gives it a pretty deep red tinge.

In gout too, the termination of the paroxysms is most perfectly indicated by a copious lateritious sediment, and when this suddenly disappears, and the urine at the same time affords a precipitate with the muriate of mercury, a fresh attack or relapse may be expected.

We have examined several portions of this sediment, and have generally found it to be composed of lithic acid, phosphate of lime, and some peculiar animal matter, but little soluble in water ; it has by some been supposed to consist entirely of lithic acid ; but this substance, for the most part, constitutes by far the smallest part.

In jaundice, the state of the disease may be ascertained by examining the urine, in which a very small quantity of bile may be detected by the nitrous or muriatic acids, but more particularly the latter ; when, therefore, the urine ceases to become green on the addition of these acids, we may infer that the obstruction to its passage into the duodenum is removed, and that, consequently, the yellowness of the skin, &c. will soon disappear.

The spasmodic affections that take place in many

nervous complaints, are immediately indicated by the urine, for upon the approach of these, it will most generally be found very transparent, large in quantity, and abounding in saline, but containing hardly any extractive matter. Similar appearances have been observed to precede delirium in fevers. This state may be discovered by the infusion of oak bark, with which it will hardly give any precipitate, and by the acetite of lead, which will produce a very copious one.

The necessity of attending to the different changes, which the urine undergoes in Diabetes, has been already sufficiently shewn.

In scurvy, and some other putrid diseases, as they have been called, we make no doubt the appearance and properties of this fluid are sufficiently remarkable, and we would recommend it to be examined by those, who have proper opportunities.

Can internal ulceration and suppuration be detected in this way?—In some diseases of the abdomen, accompanied with tumefaction, the urine has been met with of a white colour, as if mixed with pus; and in a few instances, when this change has taken place, the enlargement has suddenly subsided—Was this colour owing to pus, and if so, was the pus taken up by the absorbents, or was it carried off by the kidneys, in consequence of some direct morbid communication? In children
who

who are subject to worms, the urine has likewise been observed to have at times a white colour, and this has been supposed to proceed somehow from the chyle: this peculiar appearance is not to be confounded with what takes place in local affections of the kidneys and bladder, where it also occurs, but is sufficiently understood. We have had no opportunities of examining this kind of urine, and cannot, therefore, give any satisfactory account of it.

We have thrown out these imperfect hints, merely with a view to induce others to pay some attention to a subject, which has of late been much neglected, but which, in our opinion, is capable of affording great assistance in the investigation, and cure of many diseases.

SECT. II.

Experiments and Observations on the Nature of Sugar, &c.

THE following observations are intended merely to explain, the nature and formation of the saccharine principle, as far as may be necessary, to illustrate some of the most important points, in the treatment of Diabetes: a complete investi-

gation of its nature, and properties, would be foreign to the present subject.

Sugar has been supposed to be a substance, intermediate between the vegetable mucilages and acids, containing more oxygene than the former, but less than the latter; with a view to ascertain this, and some other facts relative to these substances, the following experiments were made.

Two ounces of refined sugar were introduced into a retort, and exposed to a heat gradually increased, until its bottom became red hot: there came over into the receiver $8\frac{1}{2}$ drachms of a sharply acid liquor, which required 150 grains of a solution of potash to saturate it; this liquor was mixed with a little empyreumatic oil; the charry residuum which remained in the retort weighed 5 drachms nearly. The quantity of gas which escaped during the operation, must therefore have amounted to $2\frac{1}{2}$ drachms; some of this being collected, was examined, and found to consist of a mixture of carbonic acid gas, and hydro-carbonate.

Two ounces of gum arabic were introduced into a retort at the same time, and exposed to a heat in every respect similar; the quantity of acid liquor which came over into the receiver, amounted to 7 drachms, and 40 grains; this contained a little more empyreumatic oil, but was not so sharp, as that obtained from the sugar, and required only

118 grains of the same solution of potash to saturate it; the charry residuum which remained in the retort weighed 3 drachms and 45 grains; the quantity of elastic fluid or gas which escaped during this process, must therefore have amounted to about 5 drachms: it consisted, like the former, of a mixture of hydro-carbonate, and carbonic acid gas, but towards the end of the operation the proportion of hydro-carbonate was more remarkable. From these experiments it would appear that sugar yields by distillation, more pyromucous acid than gum, in the proportion of 150 to 118. The residuary charcoal of the sugar likewise exceeded that of the gum, but this may in part be accounted for, from the greater quantity of hydrocarbonate yielded by the latter. As oxygen is now allowed to be the universal acidifying principle, and as the acid produced in both instances (viz. the pyromucous) was the same, it may be reasonably inferred, that the sugar which afforded the greatest quantity of acid, contained likewise the greatest proportion of oxygen; for it is probable, that both the carbonic acid, and the hydrocarbonate, were formed from the decomposition of the water, as neither were produced in any quantity until near the end of the operation; the oxygen therefore contained in the former, should not be considered as entering essentially into the composition of either the gum or sugar.

It is well known, that vegetable mucilage and

fecula, are somehow converted into sugar by malt-ing, we conceived therefore, that it would throw considerable light on this subject, to observe with more attention than had hitherto been done, the the particular changes and decompositions which take place during this process; with this view the following experiments were made.

December 1st, 1796. A quantity of barley, after being soaked in water for 24 hours, was put into a wine glass, which was introduced into a jar containing common air, and inverted over water: the temperature in this, and the following experiments was preserved between 60, and 70 as nearly as possible. At the end of 5 days it began to grow, and on the 28th the greatest part had thrown out shoots at least half an inch in length. On February 7th, vegetation was still going on, and the air in the jar had somewhat diminished; the barley being now withdrawn, was found to be very sweet, and nearly converted into the state of malt. The air in the jar was found to consist of azotic, and carbonic acid gas, in the proportion of 20 to 6, the whole of the oxygene being either absorbed, or converted into carbonic acid.

January 19th, 1797. A quantity of barley, previously steeped in water for 48 hours, was introduced, as in the last experiment, into a jar containing oxygene gas, and inverted over water, to which sulphuric acid had been added. At the end
of

of 3 days it began to grow, and this process went on to the 29th. The water had now risen considerably in the jar, the gas having suffered a diminution of about one third. The barley being withdrawn, smelled completely like malt, and tasted sweet. The gas in the jar, on examination, was found to consist of 64 parts carbonic acid, 32 azote, and 4 oxygene, from which it would appear that the air, employed in this experiment, had contained originally about 20 per cent. of azotic gas.

To be more certain of the nature of the change which the pure air undergoes in this process, the experiment was repeated as follows.

January 23d, A quantity of barley, soaked in water for two days, was introduced into a jar containing very pure oxygene gas, and inverted over mercury. At the end of three days the barley began to grow, and the process continued for 10 days, although very slowly; the column of gas remained exactly of the same height, so that it had undergone no apparent diminution or increase; the barley being withdrawn, the air in the jar was examined, and found to consist of carbonic acid gas, mixed with only 1-50th of its bulk of oxygene gas. The barley was partly converted into malt, the quantity of oxygene being insufficient to produce this change upon the whole.

Another experiment with common air was made

at the same time, and exactly under similar circumstances. In this case the barley did not begin to grow until the end of the 4th day; and at the end of 10 days, had made much less progress than that in the oxygen gas. It was now withdrawn, and the air in the jar, which had increased a little, examined, when it was found to consist of carbonic acid and azotic gas, in the proportion of 1 to 2 nearly, mixed with a very small quantity of oxygen gas; a little of the barley tasted sweet.

Being now satisfied, that during the evolution of the saccharine principle from vegetable mucilage &c. a quantity of oxygen, was either absorbed, or converted into carbonic acid; we wished to know if this process could take place in any degree, without the presence of this gas.

In order to determine this point, the following trials were made.

January 20th, A quantity of barley, soaked as in the former experiments, was introduced into a jar filled with and inverted over mercury. At the expiration of 12 days a very considerable quantity of gas was produced, at least five or six times the bulk of the barley, but nothing like vegetation was perceivable: this, on examination, was found to be carbonic acid gas, being entirely absorbed by lime water. The barley had not the least sweet taste, nor did it appear to have undergone any sensible change.

On January 20th, Another portion of the same soaked barley, was introduced into a wine glass, and placed in a jar containing nitrous gas, inverted over water. At the expiration of 10 days, the gas had undergone a slight diminution, but there was not the smallest appearance of vegetation. The barley being withdrawn, and examined, was found to have undergone no apparent change. The gas contained about 1-9th of its bulk of carbonic acid, the remainder being pure nitrous gas, as was manifest from the diminution it underwent, when mixed with pure air. The nitrous gas which disappeared in this instance must have been absorbed either by the barley or the water; the carbonic acid gas which was found mixed with it, is accounted for by the last experiment.

Two other portions of soaked barley were introduced into jars, the one containing hydrogenous, and the other azotic gas, and inverted over mercury. At the expiration of 12 or 14 days, there was not the least appearance of vegetation in either, but the gas in both had increased in bulk about 1-5th. The barley being withdrawn and examined, that in the hydrogenous gas tasted musty, but not in the least sweet; the portion in the azote appeared to have undergone no change. The gas in both jars contained from 1-3d to 1-4th of its bulk of carbonic acid, the remainder being the original gases not sensibly changed.

From

From these experiments, therefore, it is manifest that oxygene is absolutely necessary for the conversion of vegetable mucilage, and fecula, into sugar; as in no one instance was saccharine matter formed, where this was not present, and the quantity of the former, bore always a certain proportion to that of the latter; for we found in all the trials, that when the oxygene was consumed, this process immediately ceased.

It may still remain doubtful, whether the oxygene is absorbed by the barley, or merely converted into carbonic acid; we are inclined to think, that it is chiefly absorbed, although part may also be consumed in the formation of this acid; for we have seen that carbonic acid is formed without the presence of oxygene gas, and that in very considerable quantity, which we conceive, must proceed from the decomposition of the water, whose oxygene unites with the carbonaceous principle of the barley, whilst its hydrogen is fixed, and may be necessary to the production of the saccharine principle. We suppose, therefore, that vegetable mucilage is converted into sugar by being deprived of part of its carbone, whilst at the same time it unites with a greater proportion of oxygene, and probably also with hydrogen, from the decomposition of the water. Thus then, both from analysis and synthesis, it would appear that sugar contains more oxygene than gum or mucilage.

lage. From this hypothesis it should follow, that if sugar were deprived of part of its oxygene, it must lose its sweetness, and form something like a gum. To see how far this might be accomplished, was the object of the following experiments.

A quantity of syrup was introduced into a jar filled with, and inverted over mercury, to this was admitted about an equal quantity of the phosphuret of lime; a considerable production of phosphoric gas almost immediately took place, and the mercury descended in the jar. At the expiration of eight days, the syrup was withdrawn, and examined; it had no sensibly sweet taste, but rather a bitter astringent one; when filtered, alcohol produced a copious white precipitate in flakes, very much resembling mucilage separated from water by the same substance.

This experiment was somewhat varied as follows: a little refined sugar was dissolved in alcohol, and to this solution a little phosphuret of lime was added; no phosphoric gas was disengaged, nor was there any apparent action produced. More phosphuret being added, the mixture was allowed to remain in an open phial for several days. The alcohol having now evaporated, some distilled water was added; but this produced no disengagement of gas, as the phosphuret had been decomposed, and converted principally into phosphate of lime. The mixture being

ing filtered, and the clear liquor evaporated, there remained a substance extremely tenacious, and which had much the appearance of gum arabic; its taste was bitter, with a very slight degree of sweetness; when squeezed between the teeth it had exactly the feel of gum, but more tenacious. It did not appear to be soluble in alcohol, or at least in any considerable quantity; when thrown upon a red-hot iron it burned like gum, and left a bulky and insipid charcoal.

It would appear that the saccharine principle had been destroyed in these experiments, and converted into something resembling a gum; that this was effected by the abstraction of oxygene is rendered highly probable, from the nature of the substance employed, and the change which it was found to have undergone; for there are few substances, which have so strong a tendency to combine with oxygene, as the phosphuret of lime.

Some other trials of a similar nature were made, by mixing solutions of sugar with the different sulphurets, and by agitating them with nitrous gas in close vessels. The sulphurets, more especially that of potash, manifestly destroyed the saccharine taste, but on account of the solubility of the different products, the nature of the change could not be so easily, and accurately ascertained. The action of the nitrous gas was more doubtful.

In order to be satisfied how far the effects produced

duced on the sugar in the former experiments, might be owing to the abstraction of oxygene, we added to solutions of this substance in water, both lime and pure potash, and boiled the mixtures for some time. The lime manifestly combined with the sugar, to which it communicated a very bitter astringent taste, but it was still sweet; a little alcohol added to the filtered solution, produced a precipitate in white flakes, somewhat similar to that in the experiment with the phosphuret, and which appeared to be a combination of sugar with lime; Vitriolic acid likewise precipitated the lime in the form of selenite, and in a great measure restored the natural taste. Some of the filtered solution being evaporated by a gentle heat, there remained a semi-transparent substance, much more tenacious than the thickest syrup, but not equal to that produced by the phosphuret of lime, and it had a rough bitter taste, mixed with a certain degree of sweetness. The potash likewise appeared to combine with the sugar, the sweet taste being more completely destroyed than by the lime; but on the addition of sulphuric acid, sulphat of potash was formed, and this being precipitated by alcohol, the sweetness appeared to be completely restored. It may likewise be proper to observe, that when alcohol was added to a portion of the solution of sugar and pure potash, after it had been boiled to the consistence
of

of a syrup, no union took place, but the alcohol, notwithstanding the mixture was completely, and repeatedly agitated, still swam pure on the top; a circumstance which would seem to prove that a new compound is formed by these substances, which is not soluble in this fluid, although they are both completely so in a separate state.

Having found, that sugar might be converted into a species of gum, by depriving it of part of its oxygene, we conceived that gum might, by the addition of oxygene, be changed into a substance resembling sugar; but although several trials were made, with a view of combining oxygene, in different proportions, with gum arabic, no remarkably sweet taste was at any time perceived; on the contrary, in every experiment, it seemed to run very readily into the acid state, particularly when it was exposed to the action of the oxygenated muriatic acid gas.

From the failure of these trials to convert mucilages into something resembling sugar, we began to suspect that they were not so simple, as had been generally supposed; with a view to throw some light on this subject, the following comparative experiments were made:

One ounce of powdered gum arabic was introduced into a coated glass retort, to which a receiver with the pneumato-chemical apparatus was adapted; heat being gradually applied, there came over into the receiver 3 dr. 30 gr. of pyromucous acid

acid, mixed with a little heavy empyreumatic oil; after the retort had been red hot for some time, it was removed, and the charry residuum, which it contained was found to weigh 1 dr. 46 gr.. This had a greyish colour, and burned very slowly; but when exposed to a strong heat in an open crucible, it left a whitish powder, amounting to 10 grains, which was found to be lime mixed with a very small proportion of calcarious phosphate.

The pyromucous acid being super-saturated with lime, a strong smell of ammonia was instantly perceived, and a piece of paper dipped in muriatic acid, being held over the vessel, copious white fumes were immediately produced. This circumstance shews, that azote forms a constituent part of the gum.

There were collected in the pneumatoc chemical apparatus, 273 oz. measures of gas; of this 93 were carbonic acid, and the remaining 180 that species of hydrocarbonate, which is obtained by heat from moistened charcoal.

Two measures of this gas, well freed from carbonic acid, were mixed with $1\frac{1}{2}$ of very pure oxygen gas, and introduced into a strong glass jar, filled with, and inverted over mercury; when fired by the electric spark, they occupied the space of one measure only; lime water being admitted, the whole was absorbed, except a very small particle, which

which was found, from the nitrous test, to be pure air. From a number of experiments we have found, that twelve measures of oxygene gas when united with carbone, produce 10 of carbonic acid gas. Hence it follows, that the quantity of oxygene gas necessary to the formation of carbonic acid gas must in this case have been 1. 1. measures, or a little better; the remaining .4 must therefore have been consumed in the production of water, and would be sufficient to saturate .8 of hydrogen, equal in weight to .048 of a grain nearly.

Now an ounce measure of carbonic acid gas weighs .864 of a grain, and this contains .24 of pure charcoal; hence the quantity of charcoal to hydrogen in this inflammable gas, must be as .24 to .048, or 5 to 1.

But one measure of pure hydrocarbonate, such as may be obtained from the decomposition of camphor, by making it's vapour pass through a red hot earthen tube, or from the distillation of animal substances, opium, &c. requires two of pure air to saturate it, and the quantity of carbonic acid amounts to 1.45. which makes the proportion of carbone to hydrogen, as 12 or 13 to 1; hence these gases differ materially, and ought not to be confounded; indeed the difference between them is manifest, from the manner in which they burn when mixed with common air, and brought into contact with an ignited body;

pure

pure hydrocarbonate burns slowly with a perfectly white flame, and never detonates; on the contrary, the compound inflammable gas just mentioned, burns rapidly with a reddish blue flame, and more or less of a detonation. We thought it necessary to mention this circumstance, as much confusion might be produced by applying the same name, to substances considerably different. It is remarkable that æther decomposed by heat, affords pure hydrocarbonate, whilst alcohol yields the mixed species.

But to return—an ounce of gum tragacanth was submitted, in a coated glass retort, to a similar process, and the products collected were as follows:

	<i>Dr. Gr.</i>
Charcoal remaining in the retort	1 45
Pyromucous acid	4 5
Carbonic acid gas	78 oz. meas.
Hydrocarbonate	91 ditto

The charcoal burned slowly with a peculiar phosphorescent flame, and left a white residuum of 12 grains, which was found to consist of lime mixed with a little calcarious phosphate.

The pyromucous acid being super-saturated with lime, the quantity of ammonia disengaged appeared to be considerably greater, than from that afforded by the gum arabic.

Having in this way discovered lime in both species

cies of gum, we were anxious to know, if this earth could be detected by reagents, without having recourse to decomposition by heat. Accordingly a quantity of sulphuric acid was dropped into a solution of gum arabic : after standing for some hours, a number of needle-like crystals were slowly deposited ; these being separated were redissolved in distilled water ; to this solution the oxalate of ammonia was added, when a copious precipitate of oxalate of lime immediately took place.

From these experiments therefore, it is manifest, that gums consist of oxygene, hydrogen, carbone, azote and lime, with a little phosphoric acid.

An ounce of refined sugar was next introduced into a coated retort, and the pneumato chemical apparatus applied as in the former experiments. The products obtained were,

	Oz.	Dr.	Gr.
Pyromucous acid, with a drop or two			
of empyreumatic oil	0	4	30
Charcoal	0	2	0
Hydrocarbonate	119	oz.	meas.
Carbonic acid	41	oz.	meas.

The Pyromucous acid being super-saturated with lime, not the least vestige of ammonia could be perceived—sugar therefore does not contain azote ; neither does it contain lime, for the charcoal, which was of a beautifully black colour, burn-
ed

ed out completely, when exposed to a strong red heat.

Being desirous of ascertaining more completely, the difference between common sugar, and the saccharine matter secreted by the breasts of animals, an ounce of the crystallized sugar of milk, was distilled in an apparatus similar to that already described, and the products were found to be

Oz. Dr. Gr.

Pyromucous acid mixed with a very little empyreumatic oil	0	6	0
Charcoal with a little phosphate of lime	0	1	0
Carbonic acid gas.	31	oz.	meas.
Hydrocarbonate of the same nature with that obtained in the former experiments	103	ditto.	

The charcoal being burned in an open crucible, there remained about one grain, which appeared to be phosphate of lime chiefly.

The pyromucous acid was next super-saturated with lime, but the quantity of ammonia disengaged was so small, that it could with difficulty be detected; there appeared however to be a very little.

Hence then it would seem that this animal sugar, contrary to what might be expected, contains hardly any azote.

It would appear also, that it contains less charcoal and more oxygene than common sugar.

In order to investigate still further the nature of these substances, we endeavoured to ascertain the quantity of oxalic basis or radical, contained in each, or how much oxalic acid they would afford, when treated with an equal proportion of the nitrous acid.

An ounce of sugar was added to six ounces of the concentrated nitrous acid, diluted with an equal bulk of water; when the action had in a great measure ceased, heat was applied, and the evaporation continued until the liquor was reduced to about an ounce by measure: after this had cooled, the crystals were separated by filtration, and the remaining fluid again evaporated, until the whole, when cold, shot into a mass of crystals, leaving only a few drops which refused to crystallize; these crystals being collected, and well dried on blotting paper, amounted to 4 dr. 20 gr., or a little better than half the weight of the sugar employed.

An ounce of gum arabic was next treated with an equal proportion of nitrous acid properly diluted; the quantity of crystals collected amounted to 3 dr. 36 gr.; but in this instance, the last crystals obtained were mixed with an insoluble white powder, which being separated from the oxalic acid, by the addition of distilled water, amounted to 6 gr., and was found to be oxalate of lime.

lime. The pure acid therefore did not exceed 3 dr. and a half. An equal quantity of gum tragacanth afforded by the same process 3 drs. 10 grs. of oxalic acid and 10 grs. oxalate of lime.

An ounce of the sugar of milk was also treated in a similar manner with 6 ounces of the concentrated nitrous acid properly diluted; and there were obtained in all 3 dr. 48 gr.; these crystals, however, were mixed with a white powder, which being but little soluble in water, was readily separated; it amounted to 30 gr. and appeared to be the saccholarctic acid of Scheele; hence the pure oxalic acid did not exceed 3 dr. 18 gr. (*See page 427.*)

An ounce of honey yielded by a similar process 4 dr. 4 gr. of pure oxalic acid, but exhibited no signs of saccholarctic acid.

The following table will shew at one view the different products resulting from destructive distillation, with their relative proportions; and likewise those obtained by the nitrous acid.

Substances employed, 1 oz. of each.	Products obtained by heat.				Products obtained by nitrous acid.	
	Charcoal, &c. Oz. Drs. Grs.	Pyromucous acid, &c. Oz. Drs. Grs.	Carbonic acid gas. Oz. measures.	Hydrocarbonate. Oz. measures.	Oxalic acid. Oz. Drs. Grs.	Other substances.
Sugar - - -	0 2 0	0 4 30	41	119	0 4 20	None.
Honey - - -					0 4 4	None.
Sugar of milk	0 1 0	0 6 0	31	103	0 3 18	30 grains of faccholactic acid.
Gum arabic -	0 1 36 and lime 10	0 3 30 with some ammonia.	93	180	0 3 30	Oxalate of lime 6 grains.
Gum tragacanth	0 1 33 and lime 12	0 4 5 with some ammonia.	78	91	0 3 10	Oxalate of lime 10 grains.

From

From these experiments it would appear, that sugar consists merely of carbone, hydrogen, and oxygen, and that gum differs from sugar not only in containing a less proportion of oxygen, but also by its combination with lime and azote; and that the sugar of milk differs from both, as it contains the radical of the saccholactic acid; in other respects, however, it approaches very nearly to the nature of vegetable sugar. Does the milk of carnivorous and graminivorous animals, yield the same proportion of this acid, and is this sugar itself always of the same nature?

From the well-known facts respecting vinous fermentation, there is now reason to suppose, that no substances, but those which consist simply of carbone, hydrogen and oxygen, are susceptible of it, and that an union with a fourth, changes the nature of the compound so much, as to render this process impracticable.

With a view to throw some light on this obscure subject, the following experiments were made.

August 4th, 1798. An ounce of sugar, dissolved in 5 ounces of water, was digested with a little fresh flacked quick lime, in a moderate heat for about 15 minutes; the solution was then filtered, and about 2 drachms by measure of good yeast added; the vessel and mixture, weighing 17 oz. 2 dr. were introduced below a large glass bell.

There was placed close to it, as a standard,

H h 4

another

another vessel, containing an ounce of sugar dissolved in 5 ounces of warm water, and to which an equal quantity of yeast was added. This vessel and mixture, which weighed together 17 ounces, 1 drachm, 20 grains, were likewise placed under a glass bell. The temperature of the room during the whole of this experiment was rather high, and varied from 68° to 75° of Farenheit.

The last mixture began to ferment in 12 hours, and in 24 the process seemed very brisk, much water now condensing on the sides of the bell. In five days the process began to subside; in seven the yeast fell to the bottom, and the liquor became clear. The mixture, at this time, smelled strongly of beer turned a little sour, although it still tasted sweetish. It was suffered to remain until the 28th, when it was removed from the bell and weighed, and the loss was found to exceed three drachms; it now tasted much like a mixture of strong vinegar and honey.

During the whole of this period, amounting to 24 days, the mixture containing the sugar digested with the lime, never shewed the least appearance of fermentation, nor was there any moisture condensed on the sides of the bell. The vessel and mixture being now weighed, the loss amounted to two drachms nearly; the liquor smelled very musty, and had a rough astringent taste mixed with sweetness, but was not in the
least

least acid. In this instance the yeast fell to the bottom very soon, the liquor continued more or less muddy, and became, at last, a little mouldy at the top.

We next digested an ounce of sugar, dissolved in five ounces of water with a little potash, and to the filtered solution added about two drachms of very good yeast. This mixture was exposed in an open vessel to a temperature of about 65° ; and another vessel, containing a solution of an equal quantity of sugar, mixed with yeast, placed by it as a standard.

The solution with the yeast alone, began to ferment in 12 hours; but the other containing the potash, shewed no symptoms of fermentation at the end of 12 days.

Being now in a great measure satisfied that any fourth substance combined, although in small quantity, with the three which form sugar, would prevent fermentation; we next wished to know if every compound, consisting of carbone, hydrogene, and oxygene, however differently these substances might be proportioned, were susceptible of this process. The sugar of milk, from what has been already observed, evidently consists of these three simple substances, but from a number of its sensible properties, and the result of its analysis by heat, as well as its containing the radical of the saccholactic acid, it is manifest that their combinations and proportions must be very different from those in common sugar.

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We therefore mixed a solution of this saccharine matter with the usual quantity of yeast, and exposed it to a temperature ranging from 65° to 70° ; in four days some degree of fermentation was perceptible, and in three days more became brisk; at the end of sixteen, when this process had apparently ceased, the liquor was examined; it now had the smell of cyder, but rather more of the flavour of apples; to the taste it was very sour, and when added to the tincture of litmus, strongly reddened it.

The acid thus produced, either contained, or consisted of common vinegar; for, with the oxyde of lead, it formed a sweet saline mass, composed evidently of slender prismatic crystals, which were not deliquescent*.

Hence it is manifest, that the sugar of milk is at least in some degree susceptible of the vinous fermentation.

Having observed in our attempts to convert gum into sugar, that it seemed to run easily into the acid state, we were anxious to know if any thing like fermentation preceded this state, or if it was possible to convert it into an acid, by mere exposure to the air, without the addition of some substance containing much oxygene, as the nitrous or oxygenated muriatic acids. Accordingly a solution of gum arabic, mixed with a proper proportion of
good

* See Scheele's Essays, page 274.

good yeast, was introduced into an open vessel, and kept at a temperature ranging from 68° to 75° for twenty-six days, but during this period nothing like fermentation was perceived—the mixture at last emitted a very peculiar and offensive smell, the gum however, still retained its natural taste, and was not in the least sour. In this case it would appear, that the azote, and lime, which in the gum are combined with carbone, hydrogene and oxygene, prevented the vinous fermentation, and consequently the formation of any thing like vinegar.

It has been supposed, that a decoction of purely animal matter, might undergo certain spontaneous changes, and at last become acid. In order to determine this point, about sixteen ounces of a strong decoction of beef were introduced into an open vessel, and kept at the temperature of about 68° , or 70° . A few days after, an equal quantity of a similar decoction, mixed with an ounce of yeast, was likewise exposed in an open vessel, to air of the same temperature.

At the end of five days, the decoction, without any mixture, began to shew evident marks of putrefaction, but did not in the least taste acid, nor had it ever shewn any signs of vinous fermentation; in two days more it became extremely offensive, accompanied with the production of ammonia,

The

The decoction with the yeast did not shew any evident signs of putrefaction until the seventh day, but there was nothing like fermentation perceived; in two days more, it became extremely putrid and offensive, and was thrown away.

Hence it would appear, that neither vegetable nor animal mucilages are, when pure, in any degree susceptible of the vinous fermentation; indeed these are facts, which have been so generally admitted, that had not a contrary opinion been lately advanced, we should have conceived the three last experiments unnecessary.

The mistake has no doubt arisen from observing the facility with which a decoction of a mixture of animal and vegetable matter, runs into the acid state; but in this case, the animal substance performs the part of yeast only; and it is in this way that diabetic urine so readily ferments spontaneously, and becomes vinegar.

From the preceding experiments, we may draw the following conclusions:

1st. That sugar consists of carbone, hydrogen, and oxygen; and may be considered as a pure vegetable oxyde.

2d. That sugar of milk is composed of the same principles, but contains more oxygen, and considerably less charcoal.

3d. That gum differs from sugar in containing, besides carbone, hydrogen and oxygen, both lime and azote.

4th.

4th. That vegetable farina cannot be converted into saccharine matter, without the joint action of oxygene and water, the first of which appears to be absorbed, and the last decomposed during this process.

5th. That when sugar is deprived of its oxygene, or combined with other substances, it loses its characteristic properties, and is no longer susceptible of the vinous fermentation.

6th. That neither vegetable nor animal mucilages, in their pure state, are susceptible of this process.

From a review of the whole, the propriety of the different medicines which have been employed in Diabetes must be obvious, more particularly the pure alkalies, lime water, and the different sulphurets, all of which must counteract the formation of saccharine matter in the stomach.

We also readily see the necessity of a diet, consisting entirely of animal food, being the only one which does not furnish oxygene, and that peculiar, but simple combination of carbone and hydrogene, constituting the basis of sugar, and without which it cannot be produced.

PART II.

THE RESULTS

OF THE

TRIALS OF VARIOUS ACIDS,

AND SOME OTHER SUBSTANCES,

IN THE TREATMENT

OF THE

LUES VENEREA.

BY

WILLIAM CRUICKSHANK,

AND OTHER SURGEONS OF THE ARTILLERY.

CHAP. I.

The Results of the Trials of Various Acids and some other Substances, in the Treatment of the Lues Venerea, as described in the First Edition of the Work.

SECT. I.

Trials by MR. CRUICKSHANK.

SOME years ago, DOCTOR GIRTANNER acknowledged, that the effects produced on the human body by the different preparations of mercury, were entirely owing to their combined oxygene, and that it was on the disengagement of this principle, which had a powerful action on the system producing the mercurial disease, that their antivenereal effects depended.

We do not find, however, that DOCTOR GIRTANNER had ever put this assertion to the proof, by exhibiting other substances, containing a large proportion of oxygene, in place of mercury, in the lues venera.

MR. W. SCOTT, Surgeon at Bombay, having, in 1793, made some trials with the nitric acid in diseases of the liver, was struck with the similarity of its action to that of mercury, more particularly in its affecting the mouth, and producing salivation. From these and some other circumstances, he was induced to try it in the lues venerea, and found that it was not only equally efficacious, but in several respects even superior to mercury, having succeeded where this had failed. *See Duncan's Medical Annals, 1797.*

With a view to satisfy ourselves of the antisyphilitic property of the nitrous acid, and at the same time to discover, how far this might be owing to its oxygene, the following trials were instituted.

The first substances employed were acids, such as are known to contain much oxygene, and which part with it readily; as yet we have only used the nitrous, oxygenated muriatic, and citric acids. It is well known that the basis of these are different, and the only thing which they have in common is oxygene; if therefore they should all produce the same, or nearly the same effect, on this disease, as well as on the constitution, the natural inference to be drawn is, that this must depend upon their common principle.

The only other substance which we have yet tried is the oxygenated muriate of potash, a neutral

tral salt, containing likewise much oxygene, and which parts with it very easily. We mean, however, to extend our researches farther, when a proper opportunity shall offer, and to make trials with some of the other acids, the black oxyd of manganese, &c.

In detailing the following cases, we shall satisfy ourselves with describing the symptoms at the commencement, and any remarkable change which afterwards occurred during the cure; with enumerating the doses of the different medicines employed, and their effects in general on the disease and constitution; and with giving the final result and duration of the treatment. A more particular or daily account, (although such was regularly kept) would be tiresome, and could not afford any additional information or satisfaction.

It may be proper to observe that most of the patients whose cases are here related, were kept in a ward set apart for the purpose, and where it was impossible, from the nature of a military hospital, they could procure any medicines, but such as were given to them. The cases were also selected, being primary affections, and such as were strongly and distinctly marked, and where no mercurial remedies had been employed.

Cases in which the Nitrous Acid was employed.

CASE I.

March 15th, 1797.

Battersby, a Bombardier in the Royal Regiment of Artillery, aged 23, had a chancre on the glans near the frænum, which made its appearance three or four days before his admission, and was decidedly venereal. From his own account he had taken no medicines, nor indeed was there the least appearance in the mouth to render it probable he had.

He was desired to take a drachm of the concentrated nitrous acid, diluted with 20 oz. of water, in the course of the day, and to wash the chancre frequently with a weak solution of the acetite of lead, consisting of 1 gr. of the acetite to 2 oz. of water; the only intention of which was to keep the parts clean.

On the 15th, Finding no very sensible effect from the acid, he was desired to take ʒiss in the day.

On the 16th, He was sensible of a soreness in his mouth, which he compared to that produced by mercury; he also complained of being griped; the chancre looked much cleaner, and was evidently disposed to heal; he thought he made
more

more urine than usual. To obviate the effects apparently produced by the acid on the bowels, he was ordered a grain of opium at bed-time.

On the 17th, His urine was measured, and found to amount to $2\frac{1}{2}$ pints in 24 hours; it was clear, and without any remarkable smell; his tongue was white, but the pulse natural; he had no return of the griping since he took the opium.

On the 19th, The chancre was completely healed; he now perceived no sensible effect from the acid, except a temporary one on his teeth and mouth; the griping had not returned.

On the 21st, The acid was diminished to one drachm in 24 hours, and this he continued to the 28th, when it was omitted.

He was discharged cured on the 3d April, and he remained free from any appearance of disease on *June 10th*, being 10 weeks from the time the chancres were healed.

CASE II.

Smiley, a Gunner in the Regiment, aged 20, with fair hair, and every mark of a scrophulous constitution, was admitted *March 12th*, with several venereal chancres on the glans and prepuce, accompanied with phymosis. He had taken no medicines, although the chancres had made their appearance for 8 days.

He was ordered to take a drachm of the nitrous
I i 3
acid,

acid, diluted with 2 pounds of water, in the course of the day, to use a very weak solution of the acetite of lead, as a lotion, and to confine himself to bed.

On the 13th, The phymosis rather increased, and was extremely painful.

On the 14th, The quantity of acid, as it had no sensible effect, was increased to 3iss daily.

On the 15th, The swelling had greatly abated, and the chancres looked much cleaner; he was certain that he made much more urine than usual, but perceived no other sensible effect from the acid, except a temporary one on the teeth and gums.

On the 16th, The swelling had entirely disappeared, and the chancres seemed disposed to heal.

On the 18th, The chancres were nearly healed, the quantity of urine which he passed yesterday being measured, amounted to $3\frac{1}{2}$ pints; it was of a light straw colour, with scarcely any urinous smell; the only sensible effect which he now perceived from the acid, was an increase of appetite; his tongue, however, was white in the middle, and he had a greater inclination for drink than usual.

On the 20th, The chancres were completely healed, but he continued to take the acid in the same quantity until the 28th, when it was omitted, and he was discharged on the 3d of April.

On the 25th, (3 days before he left off the acid)

3 ounces

3 ounces of blood were taken from his arm, which shewed a slight inflammatory crust on the surface. During the whole cure, nothing like salivation was perceived; the gums indeed looked a little florid, but this appearance of the gums was ascribed to the local action of the acid.

CASE III.

March 18, Sneed, belonging to the Corps of Drivers, was admitted March 18th, with a large chancre on the prepuce, which he had perceived for about eight days; there was likewise a slight discharge from the urethra, accompanied with scalding; his eyes and general appearance indicated a scrophulous habit. He had taken no medicines.

He was ordered a drachm of the concentrated nitrous acid, diluted with about a quart of water, which was to be taken at different times in the course of the day, and the chancre to be washed frequently with the weak solution of the acetite of lead already mentioned.

On the 20th, A chronic inflammation of the eyes, to which he had for some time been subject, rather increased, accompanied with headach. He was desired to diminish the quantity of acid to half a drachm, and to take an ounce of the magnesia vitriolata.

On the 22d, The inflammation in his eyes had considerably abated, and the appearance of the

chancre was much more favourable; he was ordered to increase the quantity of the acid to ʒiſs daily.

On the 26th, The chancre looked perfectly clean, and was free from pain; four ounces of blood drawn from his arm this day, had a healthy appearance. He had no preternatural thirst, but his tongue was white, and he made a larger quantity of urine than usual.

On the 29th, The chancre, although clean, did not seem disposed to heal, the acid was therefore increased to ʒij daily.

On the 3d April, The chancre began to skin; feeling no very sensible effect from the acid, it was increased to ʒijſs daily, this quantity he continued to the 14th, when the fore appearing to be stationary, it was again increased to ʒiij .

On the 16th, He complained much of thirst and temporary fits of sickness, his pulse was quick, and his tongue furred; he made about three pints of urine in 24 hours; these symptoms being ascribed to the acid, it was diminished to iſſs daily.

On the 19th, The chancre was nearly healed; the thirst and white tongue continued, but in other respects he was much better. The gonorrhœa had now entirely disappeared.

On the 22d, The chancre was completely healed, but he continued the acid to the 30th.

On the 2d May, He was discharged cured.

This

This patient, although he took the acid regularly for such a length of time, (being in all 44 days) never perceived any thing like mercurial salivation, nor were his gums or teeth affected in any sensible degree, except now and then locally.

CASE IV.

March 15th. Middleton, a Gunner in the Regiment, aged 19, and apparently of a scrophulous habit, was admitted with a large venereal chancre on the prepuce, of several days continuance; according to his own account, he had taken no medicines, nor used any external applications.

He was directed to take a drachm of the concentrated nitrous acid, diluted with the usual quantity of water, in the course of the day.

On the 18th, He complained much of griping in his bowels, in consequence of which, the quantity of the acid was diminished to half a drachm, and he was ordered a grain of opium at bed-time.

On the 20th, The affection of his bowels being removed, the quantity of the acid was increased to a drachm daily. The chancre now looked much cleaner, and was free from pain.

On the 22d, Feeling no sensible effect from the acid, the quantity was increased to ʒiſs daily.

On the 30th, The chancre was nearly healed; he was not now sensible of any effect from the
medicine,

medicine, except a temporary one on his teeth, immediately after each dose.

April 10th, The quantity of acid was increased to ʒij daily, and feeling no effect from this, it was again augmented on the 12th to ʒiiss.

On the 14th, He took ʒiij of the acid in the course of the day, without being sensible of any very remarkable effect from it. The chancre was now very nearly skinned over.

April 18th, The chancre was completely healed, but he continued the acid to the 26th, and was discharged cured on *the 28th*. He remained perfectly well on *June 12th*.

*Cases in which the Oxygenated Muriatic Acid
was employed.*

CASE V.

Holliday, a Gunner in the Regiment, aged 24, was admitted into the Hospital on the 12th March, with several venereal chancres on the prepuce, of eight or nine days continuance; from his own account, he had taken no medicines, nor used any external application.

He was ordered to take five drops of the oxygenated muriatic acid, diluted with about an ounce of water, three times in the day, and to use the weak saturnine lotion already mentioned.

On

On the 14th, The medicine having no sensible effects, and the chancres remaining much the same, he was desired to take six drops four times a day.

On the 16th, The chancres looked cleaner, and some of them seemed disposed to heal; he was desired to increase the acid to eight drops four times a day.

On the 18th, The chancres were nearly healed; he complained that his gums felt tender and his teeth on edge; he now made four pints of clear urine in the day. He was desired to increase the acid to 10 drops four times a day.

20th, The chancres were completely healed; he still complained of his mouth, but his gums had nothing of that appearance produced by mercury, nor was his breath in the least offensive. He was ordered to increase the acid to 15 drops four times a day; this he continued to the 28th, when it was omitted, and he was discharged cured *April 3d.*

A few days before he left off the oxygenated muriatic acid, four ounces of blood were taken from his arm, which did not in its appearance differ materially from healthy blood.

CASE VI.

Gray, a Gunner in the Regiment, aged 23, was admitted March 12th, with a deep venereal chancre,

chancre, seated partly on the glans and partly on the prepuce; it began to make its appearance on the 4th of the month, about eight days before. He has never had the venereal disease, and says he has taken no medicines.

He was ordered to take fix drops of the oxygenated muriatic acid three times a day, and to use the weak saturnine lotion.

On the 16th, The chancre being much the same, he was desired to increase the acid to eight drops four times a day.

On the 18th, He complained that the acid affected his mouth; the chancre, however, being much the same, it was increased to 10 drops four times a day.

On the 19th, The dose was augmented to 15 drops, and on the 20th to 20 drops four times a day; the chancre now looked much cleaner, and was free from pain.

On the 22d, Although the chancre looked clean, it had no appearance of healing, the dose of the acid was therefore increased to 25 drops, and on the 23d to 30 drops four times a day.

On the 25th, He complained of thirst, his tongue became a little white, but his pulse was not quickened; he made, during the last 24 hours, nearly two quarts of limpid urine; four ounces of blood taken from his arm this day appeared to be natural, or very nearly so.

On

On the 28th, The chancre shewed a disposition to heal; he still complained of thirst, and his tongue was a little furred; the acid was increased to 35 drops four times a day.

On the 30th, The chancre not being completely healed, the dose of the acid was increased to 40 drops.

On the 1st of April, It was completely healed, leaving a considerable indentation. He continued the medicine, however, several days longer, and was discharged cured on the 11th.

Although *Gray* complained frequently of his teeth and gums, the latter had never the appearance produced by mercury, nor was there the least tendency to salivation.

He remained perfectly free from disease on *June 10th*.

CASE VII.

Cowen, aged 19, belonging to the Corps of Drivers, was admitted *March 18th*, with several venereal chancres on the glans and prepuce; there was likewise an incipient bubo in the right groin.

He was ordered to take eight drops of the oxygenated muriatic acid four times a day, and to use the very dilute saturnine lotion already mentioned.

On the 20th, The chancre and bubo remaining much the same, the quantity of the acid was increased to 20 drops four times a day.

On

On the 21st, A manifest fluctuation was perceived in the bubo: he was desired to continue the acid, and to apply an emollient poultice to the bubo three times a day.

On the 23^d, The bubo had burst, and discharged a considerable quantity of pus; the chancre looked much cleaner; the dose of the acid was increased to 25 drops.

On the 25th, He began to complain of thirst and a slight degree of headach; his tongue was white, but his pulse natural; the dose of the acid was increased to 30 drops.

On the 26th, The headach increased, accompanied with much languor, a white tongue, quick pulse and great thirst: 12 ounces of blood were drawn from his arm, on the surface of which, after cooling, there was a thick crust of coagulable lymph; the dose of the acid was diminished to 25 drops.

On the 27th, He was much easier, being greatly relieved by the blood-letting.

On the 28th, The chancre and bubo remaining stationary, the quantity of the acid was increased to 30 drops four times a day.

On the 30th, The chancre and bubo looked very clean, and disposed to heal; he still complained of thirst, but felt no other sensible effect from the medicine; the dose was increased to 35 drops.

On the 1st of April, The quantity of the acid was

was further increased to 40 drops, four times a day.

On the 3d, He complained much of foreness in his mouth, but there was little or no redness in the gums, and no disposition to spit.

On the 5th, The appearance of both chancre and bubo was much more favourable, and although he complained of his teeth and gums, the dose was increased to 45 drops.

On the 7th, The bubo was nearly healed, and on the 9th was entirely closed up; the chancres likewise were perfectly clean and free from pain.

On the 10th, The quantity of the acid was increased to 50 drops four times a day. He still complained of thirst, but felt no other inconvenience from the acid.

On the 17th, The chancres shewed a disposition to heal: his thirst continued, and he made about three quarts of pale urine in 24 hours.

On the 19th, The chancres were nearly healed, and on the 22d were perfectly skinned over. He continued the acid, however, to the 30th, and was discharged cured *May 5th*.

CASE VIII.

Kilpatrick, aged 20, belonging to the Corps of Drivers, was admitted March 18th, with chancres on the glans and prepuce, accompanied with phymosis,

mosis, and an enlargement of the glands in the left groin. He had taken no medicines.

Eight drops of the oxygenated muriatic acid, diluted with an ounce of water, were ordered to be given three times a day.

On the 20th, The dose of the acid was increased to 12 drops four times a day; and he was desired to wash the chancres with the weak solution of the acetite of lead already mentioned.

On the 22d, The swelling of the prepuce was considerably diminished, but the tumor in the groin remained stationary. The acid was increased to 20 drops four times a day.

On the 24th, Feeling no sensible effect from the medicine, the quantity was increased to 25 drops four times a day.

On the 26th, He began to complain of thirst, and thought he had made more urine than usual; his tongue was likewise white in the middle, and the pulse quicker than natural.

On the 28th, The appearance of the chancres was much the same, although the swelling of the prepuce had diminished; the lymphatics on the back of the penis were considerably inflamed, forming a hard cord; the dose of the acid was increased to 35 drops.

On the 31st, The appearance of the chancres, &c. continuing much the same, the quantity of
the

the acid was increased to 40 drops four times a day, and on the 3d of *April* to 45 drops.

April 6th, He began to complain of his teeth and gums, but the latter were not inflamed, nor was there any appearance of salivation; the white tongue and thirst continued, or rather increased.

April 9th, The chancre looked much cleaner, and the inflammation of the lymphatics on the back of the penis was greatly diminished; the quantity of the acid was increased to 50 drops four times a day.

On the 12th, The cord formed by the lymphatics could not be perceived, and the discharge of the chancres had greatly diminished; the thirst and white tongue rather increased.

On the 15th, The chancres looked perfectly clean, but he complained much of thirst, and an acute pain in the right side of his chest, which affected his breathing, accompanied with cough; he was desired to diminish the dose of the acid to 40 drops, and to lose 8 ounces of blood from the arm.

April 17th, The cough and pain in the chest were almost entirely removed, being immediately relieved by the blood-letting; the blood drawn was cupped and remarkably fizy.

On the 18th, The quantity of the acid was increased to 45 drops four times a day.

April 22d, He was ordered 50 drops four times a day, and on the 28th the quantity was increased

to four drachms daily. By this time the chancres were very nearly healed.

May 4th, The chancres were completely healed, leaving very deep indentations; but he continued the acid to the 12th, when he was discharged cured.

On June the 10th, He remained perfectly free from any complaint.

The obstinacy of the disease in this case must doubt have been owing to some peculiarity of constitution. What would have been the effect of mercury in such a case: and would the cure have been more or less tedious?

Cases treated by Lemon Juice, or the Citric Acid.

CASE IX.

Clarke, a Gunner in the Regiment, aged 21, had a chancre on the glans, apparently of no long continuance, and for which he was admitted into the Hospital *March 12th*.

He was desired to take an ounce of lemon juice, diluted with two or three ounces of water, three times a day, and to use the weak saturnine lotion.

March 15th, The chancre looked somewhat cleaner; not being sensible, however, of any effect from the acid, the quantity was increased to an ounce four times a day.

March

March 17th, The chancre was partly healed, and perfectly free from pain; he now made more urine than usual, and the quantity, during the last 24 hours, amounted to two quarts, or a little better; his appetite was likewise improved.

On the 20th, The chancre was completely healed; he continued the lemon juice, however, to the 28th, and was discharged cured on *April 3d*.

A few days before he left off the acid, some ounces of blood were drawn from his arm; this did not materially differ from healthy blood, except in being a little more florid. This case upon the whole was slight, but the fore had nevertheless all the characteristics of the true venereal chancre.

CASE X.

Campbell, a Driver, aged 24 years, was admitted into the Hospital *March 12th*, with several chancres on the prepuce and glans, and which he had perceived for eight or ten days; there was also a slight degree of paraphymosis: from his own account he had taken no medicines.

He was ordered to take an ounce of lemon juice, diluted with two ounces of water, three times a day, and to keep the parts clean with the usual weak saturnine lotion.

On the 15th, The chancres looked a little cleaner; perceiving no sensible effects from the acid,

the quantity was increased to an ounce four times a day.

March 17th, The chancres were evidently cleaner and less painful, but a tumor began to make its appearance in the right groin, in consequence of which the acid was increased to five ounces daily, and cold applications, consisting of a solution of the acetite or sugar of lead, were frequently applied to the tumor.

On the 19th, The tumor in the groin had greatly diminished, and was much less painful; his appetite was now considerably increased, and he was sensible that he made much more urine than usual.

March the 22d, The chancre looked perfectly clean and disposed to heal, and the tumor on the groin was less painful. He was desired to continue the lemon juice, with the cold applications, and to have a number of small electric sparks drawn from the tumor once a day.

On the 26th, The chancre was nearly healed, and the tumour in the groin greatly diminished; he still continued the lemon juice, cold applications and electricity.

On the 29th, The chancre was healed, and the enlargement of the glands in the groin hardly perceptible. He never perceived any sensible effect from the medicine, except an increase in the quantity of his urine, and some improvement in his appetite.

On

On the 31st, The tumor in the groin had entirely disappeared, but the lemon juice was continued to April 6th.

April 13th, There appeared an excoriation in the place where the chancre was, and the tumor in the groin began to return. The acid was resumed, and cold application had recourse to as before.

On the 19th, The excoriated part was completely skinned, and the enlargement of the glands rather less. The quantity of the acid was increased to eight ounces in the day.

On the 22^d, The tumor had entirely subsided, and he continued well in other respects. The acid was persevered in, however, until the 28th, when he was discharged cured.

On June 10th, He remained perfectly free from any venereal complaint.

CASE XI.

Johnstone, belonging to the Corps of Drivers, aged 18, and apparently of a scrophulous habit, was admitted *March 18th*, with a large chancre on the glans, and a considerable enlargement of the glands in the right groin; from his own account, he had taken no medicines, nor used any external applications. He was ordered to take an ounce of lemon juice, diluted with about two ounces of water four times a day, and to apply cloths wetted

with a cold solution of the acetite of lead to the tumor frequently.

March the 20th, The appearance of chancres and bubo remaining much the same, the quantity of acid was increased to five ounces in the day.

On the 22d, The chancres looked cleaner, but the bubo increased, and manifestly contained a fluid.

On the 26th, The chancre was healed, but the bubo increased, and seemed advancing towards suppuration.

On the 28th, An emollient cataplasm was applied to the groin twice a day, the tumor now evidently containing pus. The acid was continued as before.

On the 31st, The tumor burst, and discharged a considerable quantity of pus.

April 4th, The discharge from the bubo was considerably diminished, and the hardness of the surrounding parts entirely dissolved. Common dressings were now applied, and the acid continued.

On the 7th, The bubo was surrounded by a kind of erysipelatous redness, and was rather more painful to the touch than for some days past. Over the common dressings he was desired to apply a cold poultice, containing half a drachm of the acetite of lead, to be renewed night and morning.

April 10th, The erysipelatous redness had in a
great

great measure disappeared, and the fore was now free from pain. The discharge was thin and watery, mixed with a proportion of a curdled kind of pus, similar to that from scrophulous sores. The acid and saturnine poultice were continued. He has never perceived any sensible effect from the acid, except a temporary one on his gums and teeth; and has had no remarkable thirst, although the quantity of urine has been increased.

On the 14th, The erysipelatous redness surrounding the bubo having entirely disappeared, the saturnine poultice was discontinued, and nothing but common dressings applied.

April 18th, The bubo was nearly healed. As he perceived no sensible effect from the acid, the quantity was increased to six ounces daily.

On the 24th, The fore was completely healed, but he continued the acid to the 6th of May, and was discharged cured on the 11th. A few days before he left off the medicine, some ounces of blood were drawn from his arm, this, after standing a short time, shewed on its surface a very thin coat of coagulable lymph, of a bluish white colour.

In this case, during the whole cure, there was little or no general affection of the system, nor was there any appearance in the mouth similar to that occasioned by mercury. The soreness which he sometimes complained of in his gums, was temporary, and produced simply by the local action of the acid.

Cases treated by the Oxygenated Muriate of Potash.

CASE XII.

Berryman, a Gunner belonging to the Horte Brigade, aged 17, was admitted *April 27th*, with several venereal chancres on the glans and prepuce, accompanied with a considerable enlargement of the glands in the left groin; the chancres were perceived about ten days before his admission: from his own account, and other probable circumstances, he had taken no medicines.

He was desired to take three grains of the oxygenated muriate of potash four times a day, and to use as a lotion a very weak solution of the acetite of lead.

On the 29th, The tumor in the groin rather increased, and was much more painful. Feeling no sensible effect from the oxygenated muriate of potash, the quantity was increased to four grains four times a day, and the tumor was electrified once a day, by drawing small sparks from it by a metallic point.

May the 1st, The chancres looked clean, and the tumor in the groin was considerably diminished; five grains of the salt were now given four times a day, and the electricity continued.

On the 4th, The chancres were nearly healed, and the tumor was much smaller; his tongue had
now,

now become white in the middle, and his pulse was considerably quickened, being near 90 in a minute; he also complained of thirst.

On the 6th, Appearances being much the same, the quantity of the oxygenated muriate of potash was increased to six grains four times a day. A little blood drawn from his arm the day before was evidently fizy.

May 9th, The chancres were healed, but the tumor in the groin had increased; electricity was omitted, and a cold solution of the acetite of lead frequently applied to the tumor.

On the 13th, A manifest fluctuation could be perceived in the bubo; the cold applications were continued, and the quantity of the salt increased to seven grains four times a day; and on the 16th the dose was still further augmented to eight grains.

May 18th, The bubo burst, but did not discharge much pus, being now very circumscribed. His tongue was still white, and he complained much of thirst; the same quantity of the salt was continued.

On the 22d, The discharge from the bubo was very trifling, consisting chiefly of a thin lymphatic fluid. There was no surrounding hardness, nor was it in the least painful.

On the 29th, It was completely healed; the oxygenated muriate of potash was, however, continued

nued in the quantity of eight grains four times a day to *June* the 4th, and on the 7th he was discharged cured.

This man, during the whole cure, never perceived any affection of the mouth similar to that produced by mercury.

His appetite was at no period so keen as in those cases where the acids were employed, nor was the quantity of his urine augmented in any very sensible degree.

CASE XIII.

Beates, a Gunner belonging to the Regiment, aged 17, was admitted *May* the 8th, with a number of venereal chancres on the glans, accompanied with phymosis, which had been discovered several days before his admission. He had taken no medicines.

Three grains of the oxygenated muriate of potash were ordered to be given four times a day, and the chancres to be frequently washed with a very dilute solution of the acetite of lead.

May 10th, He perceived no sensible effect from the medicine, and as the phymosis increased, he was ordered to take five grains of the salt four times a day, and to confine himself to bed.

On the 12th, The swelling of the prepuce was greatly diminished, so that it could be retracted, and the chancres were perfectly clean and free from

from pain. His tongue was white, but he did not complain of thirst. The quantity of salt was increased to seven grains four times a day.

On the 14th, The chancres were very nearly healed. He now complained of thirst, and his tongue was furred considerably in the middle; his appetite was not increased, nor did he perceive any augmentation in the quantity of his urine. The pulse was natural, or very nearly so.

May 16th, The chancres were compleatly healed, but he continued the oxygenated muriate of potash, in the quantity of half a drachm daily, until the 26th; and on the 29th was discharged cured.

In this case there was no affection of the mouth similar to that produced by mercury.

CASE XIV.

Patner, a Driver belonging to the Brigade of Horse Artillery, aged 20, was admitted *May 8th*, with several venereal chancres on the glans and prepuce, and the latter was considerably thickened. These had made their appearance for two or three weeks before he applied to his surgeon. He had taken no medicines.

Three grains of the oxygenated muriate of potash were ordered to be taken four times a day, and the sores to be frequently washed with the usual saturnine solution.

On

On the 10th, Feeling no sensible effect from the medicine, the quantity was increased to five grains four times a day.

On the 12th, The chancres looked considerably cleaner, and were less painful; his tongue was a little white in the middle, but he did not complain of thirst; he was desired to take seven grains of the oxygenated muriate of potash four times a day, and on the 18th the dose was increased to eight grains.

May 22d, The chancres were nearly healed, and the quantity of the salt was increased to 36 grains in the day.

On the 29th, They were all completely healed, but he continued the medicine to the 4th of *June*, and was discharged cured on the 6th.

In this case there was no sensible effect produced by the salt during the whole cure, except a slight fur on the tongue, and at times a greater inclination to drink than usual.

CASE XV.

Babbe, a Gunner in the Regiment, aged 22, was admitted *May 25th*, with a venereal chancre on the prepuce, of about eight days continuance. From his own account, he had taken no medicines, nor used any external applications.

He was directed to take six grains of the oxygenated

generated muriate of potash four times a day, and to make use of the usual weak saturnine lotion to keep the parts clean.

On the 28th, The chancre looked cleaner and was less painful; the quantity of the salt was increased to seven grains four times a day.

On the 30th, The chancre was perfectly clean, and seemed disposed to heal; feeling no effect from the oxygenated muriate of potash, the quantity was increased to 32 grains in the day.

June 2d, The sore was completely healed, but he continued the salt in the same quantity to the 6th, and was discharged cured on the 8th.

In this case very little general action was produced in the system; the tongue, however, was at one time a little white in the middle, and there was more thirst than natural.

CASE XVI.

King, a Gunner in the Regiment, aged 22, was admitted *May 8th*, with several large venereal chancres on the prepuce. These made their appearance about the beginning of the month, and increased very rapidly both in number and size. He was manifestly of a scrophulous habit, having red hair and large scars from scrophulous ulcers on different parts of his body. From the peculiar situation in which he had for some time been placed,

placed, it was impossible he could have taken any medicines.

Four grains of the oxygenated muriate of potash were ordered to be taken four times a day, and the parts to be frequently washed with the usual dilute solution of the acetite of lead.

On the 10th, No material alteration having taken place, the quantity of the salt was increased to 20 grains daily, and on the 12th to 28 grains.

May 15th, His tongue was now a little white in the middle, and he complained of thirst. There was likewise a little erysipelatous inflammation surrounding the chancres. In order to remove or limit this inflammation, a drachm of bark in substance was ordered to be taken along with the salt four times a day.

May 18th, The erysipelatous inflammation was less, but the appearances in other respects much the same; the quantity of the oxygenated muriate of potash was increased to 32 grains in the day, and the bark was continued.

May 22d, The chancres were much cleaner and less painful; he now complained greatly of thirst, and his tongue was considerably furred in the middle. The pulse was natural, the appetite good, and there was no sensible increase of heat on the skin; nor, although the quantity of his drink was more than usual, was there any remarkable augmentation

mentation in his urine; nine grains of the salt were now ordered to be taken four times a day, and the bark to be continued.

May 27th, The chancres were much less painful, and some of them beginning to heal; the erysipelatous inflammation had also in a great measure disappeared. The quantity of salt was increased to 40 grains in the day, and the bark continued.

May 30th, Several of the chancres were healed, and the rest perfectly clean; he thought his appetite better than when in health, although the white tongue and thirst remained, or rather increased; 12 grains of the salt were ordered to be taken four times a day, and the bark omitted.

June 3d, The inflammation about the chancres had increased, in consequence of which the bark was again ordered, to the quantity of five drachms daily, and the salt continued as before.

June 7th, The erysipelatous inflammation had disappeared, and the chancres were nearly healed. The bark and oxygenated salt were continued.

June 10th, The chancres were very nearly healed. The bark was now omitted, and the oxygenated muriate of potash increased to 14 grains four times a day.

June 18th, The chancres were completely healed, but he continued the medicine to the

25th

25th of June, and was discharged cured, on the 30th.

The chancres, in this case, healed more slowly than usual, but this may readily be accounted for, from the scrophulous habit. A few ounces of blood drawn from his arm before he left off the oxygenated salt, did not differ sensibly in its appearance from healthy blood.

CASE XVII.

Croucher, belonging to the Corps of Drivers, aged 28, was admitted *June 11th*, with a large chancre on the prepuce, of several weeks continuance, accompanied with a very considerable enlargement of the glands in the upper part of the left thigh and groin. From his own account, and other corroborating circumstances, it did not appear that he had taken any medicines.

He was ordered to take six grains of the oxygenated muriate of potash four times a day, and to apply a cloth dipped in a cold solution of acetite of lead to the inflamed glands frequently.

On the 13th, Feeling no sensible effect from the medicine, the quantity was augmented to eight grains four times a day, and the cold applications continued.

On the 16th, The chancre was perfectly clean, and free from pain, but the tumor in the groin rather

rather increased, and evidently contained pus. The dose of the salt was now increased to 10 grains, and on the 17th to 12 grains four times a day.

On the 18th, He complained of griping and purging, which he thought was owing to the medicine, it was nevertheless continued, and a grain of opium given at bed time.

On the 20th, The complaint in his bowels had disappeared, and the chancre was very nearly healed. The tumor in the groin was evidently advancing to suppuration. The same quantity of the salt was continued.

On the 22d, The chancre was completely healed; and on the 23d the bubo burst, and discharged a small quantity of matter; it was now perfectly free from pain, nor was there any hardness surrounding it. Simple dressings were applied, and the salt continued in the same quantity as before.

On the 25th, The discharge from the bubo was very trifling.

On the 28th, The bubo was very nearly healed; and on the 30th was completely so.

In all the above cases no particular regimen or diet was prescribed, nor were any of the patients, except those with phymosis, confined, either to their beds, or wards. Their diet was of two kinds—The one consisted of milk, animal food, bread, and a

pint of table beer ; and the other of animal food, with a sufficient quantity of bread and vegetables, and a quart of table beer.

We think it necessary to observe, that should relapses take place in any of the foregoing cases, they shall be faithfully related at some future period.

Observations on the foregoing Cases.

IT would appear from the cases just related, that the nitrous, citric, oxygenated muriatic acids, and more particularly the oxygenated muriate of potash, are capable of removing the primary symptoms of the Lues Venerea, and that too without producing any thing like mercurial salivation. How far these cures may be permanent, or whether the secondary symptoms may not hereafter supervene, can only be determined by further experience and observation ; as the primary symptoms, however, have not yet returned in any one instance, we should suppose that these have been completely removed ; the only doubt therefore which can reasonably remain, must relate to the secondary ones ; and if, in a few cases, should even these make their appearance at some future period, it can form no solid objections to this mode of treatment, as
familiar

similar consequences frequently follow the use of mercury.

In our first trials it was thought proper to confine ourselves to cases of primary affections; these being always less equivocal and doubtful; we intend, however, when an opportunity shall offer, to employ the same substances in the more advanced states of the disease, particularly where mercury has either failed, or had little effect.

Before we attempt to explain the *modus operandi* of these remedies, it may be proper to take a review of the effects they were observed to produce on the constitution in general.

The general effects from the acids, were an increase of appetite, an augmentation in the quantity of urine, more or less thirst, white tongue, and an increased action of the whole system, most generally accompanied with fizy blood. The Oxygenated Muriatic Acid appeared to be the most active, and the Citric Acid the least so. The Nitrous Acid in a few instances likewise affected the bowels. The oxygenated Muriate of Potash produced thirst, the white tongue and the increased action of the system, in a more remarkable degree than the acids, but there was less alteration perceived in the quantity of urine, and on the appetite. The effects therefore induced in common by these different substances, appear to be a general

increased action of the whole system, accompanied for the most part with fizy blood.

That this increased action is occasioned by the disengagement of oxygene, is rendered highly probable from the following considerations.

1st. It is now sufficiently known that oxygene is the substance which imparts to the different acids their activity, their tendency to combination, and other characteristic properties, their radicals being all different, and possessed of powers either opposite, or in no respect similar to those of the compounds or acids.

2d. The oxygenated Muriate of Potash appears to be in fact, nothing more than the common muriate, combined with nearly half its weight of oxygene; for if this substance be exposed to heat in a retort, a very large quantity of the purest oxygene gas is disengaged, what remains being the common Muriate of Potash, amounting to a little better than half the weight of the salt employed. Now it must be allowed that the common Muriate, at least in the doses given upon the present occasion, could not have produced the remarkable effects, which we have ascribed to the Oxygenated Muriate. This difference of effect must therefore be owing to its combined oxygene, a circumstance rendered the more probable when we reflect that a similar action is produced by the union of the same substance with the radicals of the acids.

3d.

3d. When oxygene gas has been inhaled into the lungs, a general increased action of the whole system has succeeded, and that sometimes to a very remarkable degree. (*See Beddoes on the Medical Qualities of Factitious Airs, &c.*)

From these considerations therefore we would infer, that the general or constitutional effects which have been observed to follow the use of these remedies, must be ascribed to the disengagement of their oxygene.

How then does this increased action cure the local sores produced by the venereal virus? Is it true that all general affections of the system suspend for a time the local ones, proceeding from this poison, or must we have recourse to some specific powers, as has generally been the case in explaining the action of mercury? We are inclined to adopt the first hypothesis, and to suppose, with Mr. Hunter, that mercury, as well as the remedies under consideration, cure this disease by exciting a new action in the system, in consequence of which the syphilitic one is suspended; and this suspension being continued for a sufficient length of time, the whole of the virus, from the change which the fluids naturally undergo, is at last completely expelled from the body.

With regard to the last hypothesis, we would observe, that there can be little or no doubt, if

oxygene could be applied directly to this poison, it would destroy it specifically, in the same manner as it destroys many others ; but it is extremely difficult to conceive how this substance, so prone to combination, should, when taken in by the mouth, be applied in its pure state to a remote local sore, in a quantity sufficient to produce any sensible effect ; and this objection applies still more strongly to mercurial remedies, because in some of these, as the *Mercur. Muriat. Corrosiv. and Mitis*, the quantity of oxygene disengaged must be extremely small. From these considerations, therefore, we are inclined to adopt the opinion, that these different remedies produce their effects, by exciting a new disease, or action in the system ; and that this action, for the reasons already given, is produced by the disengagement of their oxygene. Should this theory be correct, we have no more reason to expect relapses after a course of these acids, &c. than after one of mercury ; nay, if we conceive the virus to be absorbed, and carried into the general mass of circulation, where it must be exposed to the action of the disengaged oxygene, the patient, upon the whole, may be considered as more secure, for there will be a greater chance in this case of its complete destruction and eradication. This is a point, however, which experience alone can determine.

If

If these remedies should be found, from further experience, to be adequate to the cure of this disease in all its stages, the advantages which they possess over mercury are so great and important, that they must in a great measure supersede its use. They require no particular regimen, no confinement, are not accompanied with any disagreeable consequences during their operation, and they seem in general to produce their effects more quickly and certainly, particularly the Oxygenated Muriate of Potash. But what we consider to be of far greater importance is, that they do not appear to excite in any sensible degree the action of other diseases, more especially scrophula; one of the greatest inconveniences attending a mercurial course, and by which many have lost their constitutions, and several their lives. Mercury, besides its occasionally bringing other diseases into action, has also very deleterious effects upon some particular habits; and this has been so remarkable in certain cases, that, from the necessity of occasionally leaving it off, cures have not only been protracted, but the complaint has had an opportunity of running through all its different stages, by which the constitution has too often suffered an irreparable injury. No disagreeable consequences of this kind are likely to follow the use of these acids, or the oxygenated muriate of potash; for although they were given in several

scrophulous habits, this disease was not brought into action, nor did the health suffer in the least; on the contrary, it, in general, seemed to have been proved.

Although we suppose that mercury and the acids, &c. cure the venereal disease by exciting some peculiar action in the system, the nature of these we nevertheless conceive to be perfectly different; the mercurial action must no doubt be owing to the metal, and not to oxygene, for all the mercurial preparations, whether oxyds or combinations with acids, produce salivation, ulceration of the tongue and mouth, &c. very much alike; effects which we have shewn are not occasioned by oxygene disengaged under different circumstances. The mercurial action is also accompanied with an impaired appetite and general wasting, the reverse of which takes place during the action of the other remedies. Indeed the white tongue and fizy blood appear to be the only circumstances common to both, for in all other respects they differ essentially. We know it has been said that the nitrous acid produces salivation, but this is certainly a mistake, which has probably arisen from confounding the local and temporary foreness in the gums and teeth, occasioned by the acid, with the inflammation and ulceration produced by mercury; for in no one instance, even
where

where the common concentrated acid was given to the quantity of three drachms daily, did we perceive any thing like mercurial salivation. The mercurial action we therefore conceive, must be owing to the metal rendered active by its union with acids, &c. ; but that of the acids and oxygenated muriate of potash to the disengagement of their oxygene.

Of the different substances which we have yet employed, we would prefer the nitrous acid and the oxygenated muriate of potash ; the first, because it may be readily procured, and seems in most cases sufficiently active, and the last on account of its being the most efficacious and certain, producing, in most instances, an almost immediate effect upon the disease, without injuring the constitution. The nitrous acid which we have hitherto used, has never been perfectly pure, nor highly concentrated ; in short, it was nothing more than the common fuming acid of the shops. The nitric acid has not been tried, nor do we conceive that it would possess any superior advantages. This medicine for the most part produces a sensible effect in 6 or 8 days, and frequently accomplishes a cure in 15 or 16. We have generally begun with a drachm in the day, diluted with about a pint and a half of water ; but where the acid is only of the usual strength, and free from any metallic impregnation, a drachm and half, or even two drachms,

drachms, we believe will seldom be found too much. We have never exceeded three drachms in the day, but we do not by any means suppose this to be the greatest quantity which can be taken with safety and advantage. Of the oxygenated muriate of potash, we have generally begun with three or four grains, although in general six or eight may be given, at first, four times a day; where it produces sickness or griping, (which is sometimes the case) the dose should be diminished. We have never yet exceeded the quantity of 15 or 16 grains four times a day; not but that more might have been given, had it ever been found necessary. In one very recent case this salt has succeeded where the nitrous acid appeared to have had little or no effect, although taken for some time to the quantity of three drachms daily.

One of the greatest objections to the oxygenated muriate is, the difficulty of preparing and purifying it; nor is there any process yet known, by which it can be manufactured and sold at a low price; for these reasons we have no doubt that a very impure kind will be offered for sale, the consequences of which must be, want of success, and disappointment to those who employ it.

Its purity may be judged of by attending to the following circumstances; the crystals should be shining flat rhomboidal scales or tablets, without any mixture of cubes; they should have little or

no taste, and when thrown upon red-hot coals should detonate rapidly, with a very vivid flame, and without any decrepitation; but when the crystals feel rough, have a bitter saltish taste, and decrepitate much when thrown upon live coals, we may be certain that they contain a considerable proportion of the common muriate of potash, which is always formed in great quantity during the process. This salt, when perfectly pure, does not decompose the nitrates of silver or mercury. But this degree of purity is not necessary when it is to be employed as a medicine; only when completely or nearly freed from the common muriate, a smaller dose will be sufficient, and much less thirst excited.

The oxygenated muriatic acid appears likewise to be a very efficacious remedy in this complaint; but in the way in which it is usually prepared, it always contains manganese, and not unfrequently lead, particularly when the manganese employed has been procured from Bristol; for the manganese from the Mendip-hills very generally contains more or less of this metal. In every case where either the oxygenated muriate of potash or oxygenated muriatic acid are prepared in a medicinal point of view, nothing but the purest crystallized manganese should be used, that from Upton-pine, near Exeter, is the best. The acid given in the four cases related above, was procured by adding
the

the common muriatic acid to the oxygenated muriate of potash ; by this means a very large quantity of the purest oxygenated acid may be quickly obtained ; and it is this process we have been in the habit of using for some time, where a very pure acid for delicate chemical experiments has been required.

Instead of making the gas pass through water in the usual way, the oxygenated salt was sometimes simply added to the common muriatic acid, diluted with about an equal bulk of water ; in this case the salt was slowly decomposed, and the acid converted into the oxygenated acid. About a drachm of the salt, when pure, was found to be sufficient for three ounces of the dilute acid : of this we have given to the extent of half an ounce in the day, always beginning, however, with a much smaller quantity.

The preceding observations on the nature of these remedies, and their supposed mode of operation, have been thrown out principally with a view to draw the attention of others to this important subject, and to induce them to watch their effects on the constitution in general, by which we may be led to try them in some other diseases, where, from their great activity, it is highly probable they may be found of very considerable utility.

SECT. II.

Trials by DOCTORS IRWIN, JAMESON, *and*
WITTMAN.

THESE FACTS have been communicated by the GENTLEMEN whose names precede them. To whom we owe our thanks, and we trust the present publication will do them credit.

By DOCTOR IRWIN, *Surgeon to the Brigade of Royal Horse Artillery, 20th May, 1797.*

CASE XVIII.

Driver M^cVey, æt. 20, was admitted into the Hospital on the 23^d March, 1797, with phymosis, and much discharge from between the prepuce and glans, attended with with a small degree of inflammation at the extremity of the prepuce.

He was ordered one drachm of the nitrous acid, in a quart of water daily.

On the 5th day he could readily denude the glans, which was found to be much excoriated, but no chancre was discernible. He was directed
to

to wash the part with a saturnine lotion three or four times in the day.

On the 31st March, He was discharged the Hospital cured.

The only sensible effects of the nitrous acid were a white tongue, and accelerated pulse.

CASE XIX.

Gunner Brown, a stout healthy man, æt. 23, was admitted into the Hospital on the *1st April*, with a large tumor in the right groin, of the size nearly of a hen's egg: there was no chancre, or other complaint.

He was directed to take one drachm of the nitrous acid daily, and electric sparks to be drawn from the tumour every morning.

On the 18th May, He was discharged, the tumor having almost entirely subsided; a small induration merely perceptible to the touch remaining.

The same sensible effects were produced by the acid in this, as in the former case.

By DOCTOR JAMESON, Surgeon to the First Battalion of Royal Artillery, 12th June, 1797.

ON determining to try the nitrous acid in the venereal disease, in the Hospital at Woolwich,
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it was at the same time judged proper to select the most marked cases for the clinical ward, where the whole of the medical gentlemen might have an opportunity of observing the progress, and effects of the medicines.

The more immediate care of that ward having devolved upon MR. CRUICKSHANK for the last three months, I have as yet had but few cases amongst my own patients deserving much attention, and of these I shall mention only the result, without relating the daily progress.

CASE XX.

Gunner Sherrar, 1st Battalion, admitted into the Hospital, with bubo, 10th March, 1797, began the acid the same day, and was discharged cured 26th of April following.

CASE XXI.

Gunner Kain, 4th Battalion, admitted 10th March, with chancres, discharged cured 26th of May.

CASE XXII.

Gunner Evans, 1st Battalion, admitted 10th March, with chancre, discharged cured 16th April.

CASE XXIII.

Gunner More, 1st Battalion, admitted 10th March, with chancre, discharged cured 19th April.

CASE

CASE XXIV.

Gunner Clark, 1st Battalion, admitted 10th March, with chancre, discharged cured 11th April.

On the day that the above men were admitted, there was a general examination at the Hospital of the men of the 1st and 4th Battalions, to detect venereals, which afforded an opportunity of selecting cases, and in the five which came under my care the disease was but slight; at the same time I think I may be allowed to say, after nineteen years military practice, that the appearances in each case were sufficiently characterised to leave no doubt of their being venereal.

I have reason to believe also that none of them had taken mercury previously to beginning the acid, as they affirmed that they had not, and upon examining them, it was not discernible from the gums or any other circumstance.

No internal remedy but the nitrous acid, or other external application was used, but a little milk and water, which in the cases of chancre I judged necessary to cleanliness.

They all began the acid the day they were admitted, one drachm at first being diluted in a wine bottleful of water, which was given to each in the course of the day; but in Kain and Clark's cases, the quantity was gradually increased to two drachms.

White

White tongue, quick hard pulse, and other appearances of increased action, generally supervened about the 7th day.

I did not observe any forenefs or other appearance in the mouth, than what might be expected merely from the sharpnefs or astringency of the acid.

Their appetites seemed remarkably good during the time they were taking the acid, which produced no particular effect upon the bowels in the five cases I have already mentioned; but in Gibbs's and Buxton's, now in the Hospital under cure, it occasioned a sensation like heart-burn, or, as Buxton expressed himself, like scalding water in his stomach immediately after taking it; however, it did not affect them in this manner until each of them had taken it several days; and though I diminished the quantity to less than half a drachm daily in both cases, I was at last obliged to omit it altogether.

Buxton had taken mercury for three weeks previously to beginning the acid; had a large ulcer in the groin, and was much debilitated, which induced me to substitute the acid.

Gibbs had also taken mercury above a month, and was much debilitated by a large suppurating bubo in the groin, at the time he began the acid. It did not produce any other apparent changes in either of them.

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These

These two, with the five discharged cured, are the only venereal cases which have come under my care since I had an opportunity of trying the nitrous acid.

I sent for the men who had been discharged, to ascertain whether the disease in any had returned, and re-examined them at the Hospital on the 10th of June, when they all continued apparently well.

Whether the acid acts specifically by giving out pure air, or inducing a new action in the system, or whether the disease, when cured in this manner, (agreeable to our present opinion) is liable to return after certain periods, must rest with future observation and experience, as our trials, though so flattering in the general results, cannot, in my opinion, as yet be admitted as decisive or sufficient tests; but so far as we have gone, I am happy in adding my testimony to the others that have been adduced, of the singular advantages already resulting from the use of the nitrous, also from the citric and oxygenated muriatic acids, and from the oxygenated muriate of potash, in the clinical ward; and I have no doubt but that on many occasions they may supersede, and in future be found better adapted to many constitutions than mercury, which practitioners of experience know in some instances is productive of very deleterious effects, even in the safest hands, notwithstanding the best management.

By DOCTOR WITTMAN, Surgeon to the 5th Battalion of Royal Artillery, 12th June, 1797.

IN consequence of a letter published by Mr. Scott, at Bombay, in the East Indies, respecting the good effects of the Nitrous Acid in the cure of the Venereal Disease, I took the following patients, as they presented themselves at the Hospital, for the purpose of trial, and the sequel will prove how much we are indebted to that gentleman for his communication; particularly when we consider the mischief that frequently results, in some constitutions, from a long continued use of mercury, hitherto considered the only specific in that disease.

CASE XXV.

Gunner Kemp, a soldier in the 5th Battalion Royal Regiment Artillery, had severel venereal chancres upon the penis, about two weeks standing; he was taken into the Hospital March 13, 1797, and the nitrous acid was given, one drachm and a half in a quart of water, to be consumed in divided doses daily. The sores to be washed with a weak solution of cerussa acetata in distilled water.

April 3d, Chancres healed; appetite improved; tongue white and moist; belly costive, since the

use of the acid; requiring occasional aperients; urine of a pale straw colour.

April 9th, Remained well; discharged the Hospital.

CASE XXVI.

Gunner Piggott, a soldier, 5th Battalion Royal Regiment Artillery, had several venereal chancres upon the glans penis; was taken into the Hospital *March 16, 1797*. He was ordered the nitrous acid in the same manner as prescribed for Kemp; and the fores were kept clean by the saturnine lotion. He continued to take the acid until the *27th March*, before which the fores had been healed several days; and on the *3d April* he was discharged from the Hospital cured.

CASE XXVII.

Gunner Tayler, 3d Battalion, had a large venereal chancre upon the penis, of some weeks standing, with bubo and gonorrhœa. He began to take the acid (two drachms daily) *20th March, 1797*. Electric sparks were drawn from the bubo daily, and the fore washed with the saturnine lotion.

April 3d, Chancre healed; bubo suppurating; continue the acid, &c.

April 22d, Bubo painful.

May 15th, Bubo discharges pus.

May

May 20th, Sore in the groin is healed; continue the acid a few days longer.

26th, Being perfectly well, he was discharged the Hospital.

CASE XXVIII.

Gunner Warburton, 3d Battalion, was admitted into the Hospital on account of having venereal chancres upon the glans and prepuce of the penis; he had also a discharge from the urethra.

April 18th, 1797, He was ordered the nitrous acid, to take one drachm and a half daily, and to use an astringent injection and saturnine lotion.

May 1st, Chancres healed.

8th, Remains well; omit the acid, &c.

15th, Being perfectly cured both of chancres and gonorrhœa, he was discharged the Hospital.

CASE XXIX.

Gunner Patterson, 3d Battalion, had several recent venereal chancres upon the glans penis, only of a few days standing.

April 15th, He took the acid, one drachm and a half daily; the fores kept clean as usual.

May 1st, Sores nearly the same; the glands in the left groin enlarged and painful.

May 7th, Bubo painful and suppurating; chancres have a healing appearance; takes two drachms

of the acid daily, and has drawn small electric sparks from the bubo.

May 14th, Chancres nearly healed, bubo suppurating ; continues the acid and electricity.

May 17th, Chancres healed, bubo less painful, suppurated.

20th, Bubo discharges pus.

27th, Sore in the groin healed.

31st, Remains well ; omit the acid.

June 3d, Discharged the Hospital cured.

CASE XXX.

Gunner Pilmore, 5th Battalion, was sent from Portsmouth to Woolwich Hospital, on account of some irregularities of conduct, as well as the obstinacy of his complaints. Upon examination after his arrival, April 9, 1797, I found a large ill-conditioned chancre, with very prominent, thick, and callous edges upon the penis, and several warts upon the glans ; he had also a discharge from the urethra.

The patient says that eight months since he contracted the venereal disease, for which he had been taking mercury for a considerable time without effect ; that his mouth had been made sore ; although the mercury had been for awhile omitted, still his gums were sore.

April 9th, He was ordered the acid, one drachm and a half daily, to use an astringent injection, and to keep the sore clean with the saturnine lotion.

April

April 20th, Chancre has a better aspect; discharge from the urethra less.

May 1st, Chancre healed, right testicle painful and enlarged; discharge from the urethra abated; take an ounce of salts, apply the lotion to the testicle.

4th, Testicle painful and enlarged; take 12 ounces of the blood from the arm; continue the topical applications as before.

5th, The blood drawn yesterday was covered with a thick and tough coat of coagulable lymph; testicle rather better; repeat blood-letting and salts.

14th, Except a trifling discharge from the urethra, he is perfectly cured; continues the acid and injection.

June 9th, To be discharged to-morrow.

CASE XXXI.

Gunner Perry, 3d Battalion, was admitted into the Hospital *April 19, 1797*; he had a recent venereal chancre upon the glans penis; he was ordered one drachm and a half of the acid daily, and the fore washed with the saturnine lotion.

May 4th, Chancre healed; to continue with the acid 7 or 8 days longer.

May 15th, He was this day discharged the Hospital cured.

CASE XXXII.

I have now under my care in the Hospital, *Gunner Ritson*, a man of a scrophulous habit, who has had a very ill-conditioned ulcerated bubo in the groin, preceded by chancres upon the penis, which are healed; to whom I have given the cortex, along with the acid. He has for some little time taken three drachms of the acid daily, has not used any mercury, and is in a very fair way of cure.

The foregoing are cases with primary symptoms of the disease.

I have had only two cases with secondary symptoms of the disease, since our beginning with the acid.

TO ONE OF THEM I gave the nitrous acid. This patient had venereal eruptions on the skin, painful enlargements of the lower jaw and nose, an ulceration of the schneiderian membrane, severe headaches, a dreadful extensive ulceration in the throat, with sloughing of the tonsils, uvula, &c.

He took three drachms of the acid for three weeks, during which time the eruptions disappeared, the pain and enlargement of the jaw and nose were nearly gone; but unfortunately, from the great sloughing in the throat, we were prevented from getting down any liquid whatever, and in attempting to swallow the acid, though much diluted, it was forced back through the nostrils, and produced
much

much distress to the patient. Thus situated, we were obliged to abandon any further trial, and to have immediate recourse to mercurial frictions, which completed the cure.

The removal of the eruptions, and the great relief given to the pain and swelling of the jaw, &c. encouraged me to hope, that could the acid have been continued, in a proper quantity, more good might have resulted from it.

Since the *13th March, 1797*, I have not admitted into the Hospital a patient with symptoms of the venereal disease (except the last mentioned) to whom I have prescribed any other medicine, but the nitrous acid, nor administered it in vain.

THE SECOND PATIENT who appeared to labour under secondary symptoms of lues venerea, had nodous-like tumours upon the forehead, preceded by severe headaches, and a painful enlargement of the head of the tibia. This man had venereal chancres about three years since, and took no medicine for their cure. I gave him the oxygenated muriate of potash, as suggested by Mr. Cruickshank; he has arrived at the dose of seven grains three times a day, without producing any disagreeable symptoms, except one day a trifling headach. While taking this medicine the patient was constantly flushed with heat, had a very white, but moist tongue, copious perspirations day and night, a quick and sharp pulse. Blood drawn before and
after

after the medicine had been taken some little time, had very different appearances; namely, the former was nearly free from marks of inflamed blood, while the latter was covered with a tough and thick coat of coagulable lymph.

The patient is still under cure; one of the tumors have been relieved.

June 10th, The men discharged the Hospital have been examined, none of whom shew the least vestige of the disease upon them.

Remarks respecting the sensible Effects of the Nitrous Acid.

The appetite was almost invariably increased.

The urine was increased in quantity, clear, and of a light straw colour.

Costiveness for the most part prevailed.

The mouth and tongue white and moist.

The soreness and change produced upon the gums appeared to me to be the effect of its local action. I did not perceive that any thing like ptyalism was produced, as mentioned by Mr. Scott.

The blood drawn at different periods exhibited the same appearance as when under active inflammation, the coagulum being covered with a tough coat of coagulable lymph.

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The patients to whom I have given the acid, (except Pilmore) had not taken mercury, and the appearance of the blood drawn before the acid was employed, and the gums not discovering any marks of its action, strengthens this opinion.

CHAP. II.

The Results of the Trials of Nitrous Acid; and some other Substances, in the Treatment of the Lues Venerea, since the First Edition of the Work.

SECT. I.

Trials by DOCTOR WITTMAN.

Cases treated by the Nitrous Acid.

CASE I.

GUNNER RITSON, of apparently a scrophulous habit, was admitted into the Hospital the 26th March, 1797, with venereal chancres upon the penis, and a suppurating bubo in the right groin, which, he says, began to appear a week ago.

ago. He had not taken any medicine. He was ordered the nitrous acid, from one to three drachms daily; the sores to be washed with a weak solution of the acetite of lead, and an emollient poultice to be applied to the bubo.

April 3d, The bubo has burst; the chancres are clean. Continue the nitrous acid, and applications, as before.

May 7th, The sore in the groin has a foul and unhealthy appearance. He is ordered to take the bark along with the nitrous acid.

25th, Sore in a healing state. The bark and nitrous acid to be continued.

July 24th, He was discharged cured.

CASE II.

Gunner M^cCastlin was admitted into the Hospital *the 3d July*, 1797, with venereal chancres upon the prepuce. He was ordered the nitrous acid, from one to three drachms daily; the sores to be washed with a weak solution of acetite of lead.

20th, The chancres are healed. The nitrous acid to be continued.

25th, He was discharged cured.

CASE III.

Driver Cook, of apparently a scrophulous habit, was admitted into the Hospital *the 10th July*, 1797, with several venereal chancres upon the prepuce,
and

and a suppurating bubo in the right groin. He was ordered two drachms of the nitrous acid daily; a linseed meal poultice to be applied to the bubo; and the fores to be washed with the saturnine lotion.

July 18th, The bubo has burst; the nitrous acid and the poultice to be continued.

24th, The chancres and the sore in the groin are healed: there remains a little enlargement of the inguinal glands. He was ordered to continue with the nitrous acid, and small electric sparks to be drawn from the diseased glands.

August 2d, He was discharged cured; but was re-admitted on *December 5th*, 1797, with a recent venereal chancre upon the prepuce, and an enlargement of the right inguinal glands. He was ordered the oxygenated muriate of potash, 10 grains four times daily, and 10 drops of the muriatic acid to be taken in a little water after each dose of the potash.

The sore to be washed with the saturnine lotion.

16th, The chancre is healing. He is ordered to take 25 grains of the oxygenated muriate of potash four times daily, with the same dose of the muriatic acid as before.

Jan. 1, 1798, Chancre healed. The oxygenated muriate of potash to be continued.

15th, He was discharged cured.

CASE

CASE IV.

Driver Marshal was admitted into the Hospital the 17th July, 1797, with a large ill-conditioned venereal chancre upon the penis; phymosis, and a bubo in each groin. These complaints began to appear near three weeks ago. He had not taken any medicine. He was ordered the nitrous acid, from two to three drachms daily. The sore to be washed with the saturnine lotion.

26th, The chancre is healing. The buboes are subsiding. The nitrous acid to be continued in the quantity of three drachms daily.

Sept. 24th, The chancre is healed. The nitrous acid to be continued.

Oct. 12th, He was discharged cured.

CASE V.

Driver Williams was admitted into the Hospital the 21st July, 1797, with several venereal chancres upon the glans penis and prepuce; and a suppurating bubo in the groin. He says that the disease began to appear about four weeks ago, and he had not taken any medicine. He was ordered the nitrous acid to the quantity of two drachms daily, a linseed meal poultice to be applied to the bubo; the sores to be washed with the saturnine lotion.

29th, The

29th, The bubo has burst. The chancres are healing. The nitrous acid and applications are to be continued.

31st, The bubo is healed. The chancres are nearly well. Continue as before.

Sept. 2^d, The chancres are healed. The nitrous acid to be continued.

Sept. 18th, Discharged cured.

CASE VI.

Gunner Bosworth, of apparently a scrophulous habit, was admitted 20th July, 1797, with a painful nodous-like enlargement of the right tibia, and a glandular swelling in the neck. He says, that about four months ago he had contracted the venereal disease, and had several venereal chancres upon the glans penis, which had healed in about seven or eight days. He had taken mercurial pills, and had used a small quantity of mercurial ointment: his mouth had been made sore by this treatment. The bony enlargement came on very lately; it is painful, and tender to the touch. He has likewise severe pains in his arms, &c.

He was ordered the nitrous acid, from two to three drachms daily, and small electric sparks to be drawn from the tumours.

August 1, The node and swelling in the neck are better. The nitrous acid and electricity to be continued.

August

August 13th, He has an inflammation of the eyes, with small ulcerations of the eye-lids. The nitrated mercurial ointment was ordered to be applied to them daily, and the nitrous acid to be continued.

Sept. 1st, The pains of his limbs, swelling of the neck and node, as well as the inflammation of the eyes, being removed, he was discharged the Hospital cured.

CASE VII.

Gunner Kelk was admitted into the Hospital *the 19th July, 1797*, with gonorrhœa. In the beginning of August following, many eruptions began to appear upon his face, breast, and arms; these spots resembled venereal eruptions. He had also severe pains in his limbs, and the tibia of one leg was tender to the touch. He said, that about three months ago he contracted the venereal disease while he was in the country, and had a chancre upon the prepuce, with a bubo; the former healed, and the bubo subsided.

Aug. 9th, He was ordered the nitrous acid, from one to three drachms daily, and electric sparks to be drawn from the painful parts.

Sept. 28th, He was discharged the Hospital in good health.

CASE VIII.

Gunner Deacon was admitted into the Hospital the 1st July, 1797, with a small recent venereal chancre upon the penis, and an incipient bubo in the groin. He was ordered the nitrous acid, from one to two drachms daily.

The fores to be washed with the saturnine lotion.

July 13th, Chancre healed ; bubo nearly gone. The nitrous acid to be continued, and electric sparks to be daily drawn from the bubo.

July 23^d, He was discharged cured.

CASE IX.

Corporal Atkinson was admitted into the Hospital in July, 1797, with a painful venereal node upon the right tibia, severe pains in his nose and the bones of the face, &c. He says, that about three years ago, he contracted the venereal disease ; at that time, he had chancres, bubo, and sore throat ; he was treated by mercury pretty freely, and underwent repeated salivations. This treatment took up a period of five months ; when, being apparently cured of his venereal complaints, he was sent into the country upon furlough, to take the benefit of sea-bathing, as he was much debilitated. After some time, he returned to head-quarters, at Woolwich, in apparent good health, and did his military duty.

August 2d, He was ordered the nitrous acid to the quantity of two drachms daily.

August 14th, The node and pains are relieved. The nitrous acid to be continued.

26th, He continues to mend. He complains of a forenefs of his gums, and has a flight spitting. The nitrous acid to be continued.

Sept. 28th, He was discharged cured.

CASE X.

Driver Hartley was admitted into the Hospital *the 8th August*, 1797, with a venereal chancre upon the penis, and a suppurating bubo in the groin. These complaints began to appear some weeks ago, while he was at Warley, in Essex; he said he had taken a few mercurial pills. He was ordered the nitrous acid, from one to two drachms daily; an emollient poultice to be applied to the bubo, and the fore to be washed with the saturnine lotion.

Sept. 4th, The bubo has broke. The nitrous acid and applications to be continued.

Sept. 6th, The chancre is healed. The nitrous acid to be continued.

Oct. 30th, He was discharged cured.

CASE XI.

Driver Wilkinson was admitted into the Hospital *the 16th September*, 1797, with a venereal ulcer in the groin. He said a bubo began to appear between

tween seven and eight weeks ago, which had broke a few days previously to his admission into the Hospital: he had not taken any medicine. He was ordered the nitrous acid, from one to three drachms daily; the fore to be dressed with an ointment of wax and oil.

Sept. 29th, The fore is healed. The acid to be omitted.

Nov. 4th, He was discharged cured.

CASE XII.

Gunner Buchanan was admitted into the Hospital the 16th September, 1797, with a paraphymosis, and a large, deep, ill-conditioned venereal chancre upon the prepuce. He said these complaints began to appear about three weeks ago; he then was at Chatham, where he took a few mercurial pills. He was ordered the nitrous acid, from one to two drachms daily. The saturnine lotion to be applied to the fore.

A few days after his admission into the Hospital some venereal eruptions began to appear upon various parts of his body. He was ordered to continue with the nitrous acid.

October 8th, A fresh crop of eruptions appeared yesterday; the former ones have left a copper-coloured stain upon the skin. The chancre nearly healed. The saturnine lotion and the nitrous acid to be continued.

Oct. 30th, He was discharged cured.

CASE XIII.

Driver Donally was admitted into the Hospital, 1797, with a large venereal chancre upon the prepuce and glans penis. This man had been quartered at Lewes, in Suffex. The surgeon, who had the care of him, treated him with mercury for a considerable time, but could not heal the sore; he was therefore sent up to Woolwich. Upon his admission into the Hospital, mercury again was had recourse to, but without effect: he at length became subject to severe headaches, pains in his legs; and venereal eruptions began to appear upon various parts of his body. At this time he was ordered the nitrous acid, from one to three drachms daily, joined with a decoction of bark. A great variety of topical applications were employed during the cure, among which were the hydrogene and carbonic acid gasses, and with apparent benefit. He continued with the nitrous acid and bark a considerable time, until the sore, eruptions, and pains, were completely removed. He was discharged the Hospital cured.

P. S. I have avoided giving the daily minutes which were entered in the Journal, it being a long and troublesome case; though shewing decidedly the efficacy of the nitrous acid.

CASE.

CASE XIV.

J. Robb contracted the venereal disease from *Driver Duncan* (Case XXII). She had several chancres upon the labiæ, a bubo in the groin, and a discharge from the vagina. She was ordered the nitrous acid, and the saturnine lotion to be applied to the fores. She continued to use the nitrous acid several weeks: the bubo subsided, and she was perfectly cured by this treatment.

CASE XV.

Driver Rigby was admitted into the Hospital, 25th January, 1798, with a deep venereal chancre upon the glans penis, chancrous excoriations, and an incipient bubo in each groin. He was ordered the nitrous acid from one to two drachms daily. The fores to be washed with the saturnine lotion.

Feb. 8th, Chancre and excoriations are healed. The nitrous acid to be continued.

Feb. 19th, He was discharged cured.

CASE XVI.

Gunner Hickingbottom was admitted into the Hospital the 3d February, 1798, with a large venereal ulcer in the left groin, the consequence of a bubo, and a venereal chancre upon the frenum.

He said the complaints began to appear three weeks ago. He was ordered the nitrous acid, from one to two drachms daily ; an emollient poultice to be applied to the fore in the groin, and the chancre to be washed with the saturnine lotion.

March 19th, The chancre is healed. The nitrous acid to be continued.

April 1st, The fore in the groin is healed. The nitrous acid to be continued.

April 16th, He was discharged cured.

CASE XVII.

Gunner Thomas was admitted into the Hôpital the 4th February, 1798, with phymosis and a great purulent discharge from the penis. The inguinal glands were painful, and enlarged. We suspected concealed chancres. He was ordered to lose blood, to take a dose of salts, and the saturnine lotion to be frequently applied upon the penis.

Feb. 7th, The inflammation of the prepuce is subsided. He has several chancres upon the glans and prepuce. He was ordered 2 drachms of the nitrous acid daily. The saturnine lotion to be continued.

Feb. 20th, The chancres are healed. The nitrous acid to be continued.

Feb. 26th, He was discharged cured.

CASE XVIII.

Driver Dillama was admitted into the Hospital the 10th February, 1798, with a large ill-conditioned venereal chancre upon the penis, and an incipient bubo in each groin. He was ordered two drachms of the nitrous acid daily, and small electric sparks to be drawn from the glands. The saturnine lotion to be applied to the sore.

March 24th, The chancre is healed; the buboes are subsiding. The nitrous acid and electricity to be continued.

March 28th, He was discharged cured.

CASE XIX.

Driver Waldram was admitted into the Hospital the 6th July, 1798, with venereal chancres upon the prepuce, and an incipient bubo in the right groin: he said these complaints began to appear two weeks ago. He was ordered the nitrous acid, from one to three drachms daily. The sores to be washed with the saturnine lotion.

July 28th, One of the buboes has broke. An emollient poultice was ordered to be applied, and the nitrous acid to be continued.

Aug. 19th, The chancres are healed; the bubo is nearly well. The nitrous acid and saturnine lotion to be continued.

Sept. 7th, He was discharged cured.

CASE XX.

Gunner Holt, apparently of a scrophulous habit, was admitted into the Hospital *the 13th July*, 1798, with venereal chancres upon the frenum and prepuce, and an incipient bubo in the right groin. He was ordered the nitrous acid, from one to two drachms daily, and the sores to be washed with the saturnine lotion.

July 28th, The bubo is suppurating. The nitrous acid to be continued.

30th, The bubo has broke. He was ordered an emollient poultice; the nitrous acid to be continued.

Aug. 5th, The chancres are healed; the ulcer in the groin is accompanied with a good deal of surrounding inflammation. The poultice and nitrous acid to be continued.

Aug. 18th, The sore in the groin enlarges, accompanied with pain and inflammation. He was ordered to take the bark, in conjunction with the nitrous acid; also an opiate at bed-time, and the solution of nitrated mercury to be applied to the sore.

Sept. 13th, Sore better. The bark, nitrous acid, and the solution of nitrated mercury to be continued.

Oct. 2d, Sore heals. The bark, nitrous acid, and applications to be continued.

N. B. This

N. B. This is a subject to whom I think the action of mercury might have been very hurtful. But the progress already made towards a cure, and the present improved health of the patient, incline me to believe, that the nitrous acid and bark will be successful, in the entire removal of the disease.

CASE XXI.

Driver Littlejohns, of apparently a scrophulous habit, was admitted into the Hospital *the 8th July*, 1798, with several venereal chancres upon the prepuce, &c. and a painful enlargement of the inguinal glands. He said that the complaints began to appear about three weeks ago, while he was at Brentwood, in Essex, and that he had taken a few mercurial pills.

He was ordered the nitrous acid, from one to two drachms daily. The sores to be washed with the saturnine lotion.

July 28th, The bubo is suppurated. An emollient poultice was ordered to be applied, and the nitrous acid to be continued.

Aug. 5th, The chancres are healed; the bubo has broke. The nitrous acid to be continued.

Aug. 19th, The inguinal glands still remain in an indolent enlarged state. The bark was ordered to be conjoined with the nitrous acid, and to take five grains of the extract of hemlock every night at bed-time.

Oct.

Oct. 2d, The inguinal glands are less swelled; the health of the patient is improved. He was ordered to continue with the bark, nitrous acid, and extract of hemlock. The sore in the groin is not quite healed; but from the progress made, and the very improved state of the patient's health, I flatter myself with the prospect of a perfect cure, by the present treatment. This patient I suspect would have been a very unfavourable one to have treated with mercury: however, his general health seems now pretty good.

CASE XXII.

Gunner Arnett was admitted into the Hospital the 6th July, 1798, with several venereal chancres upon the prepuce and frenum. He said these complaints began to appear two weeks ago. He was ordered the nitrous acid, from one to three drachms daily. The sores to be washed with the saturnine lotion.

July 18th, The sores are healing rapidly. The nitrous acid and the application to be continued.

July 20th, The patient has imprudently forced back the swelled prepuce, and has brought on paraphimosis: he complains of some pain, and the sore begins to lose its former healthy appearance. The nitrous acid to be continued; the saturnine lotion to be frequently applied.

July 21st, The sores are painful, and ill-conditioned;

tioned ; there is much swelling and inflammation of the prepuce. He was ordered a dose of purging salts, and the nitrous acid to be continued ; and to take 40 drops of laudanum at bed-time.

July 25th, The chancres, inflammation, and swelling of the prepuce, are better. The nitrous acid, laudanum, and application, to be continued.

Aug. 2d, The fores are healed ; the glands in the left groin are painful, and tumefied. The saturnine lotion to be frequently applied, and the nitrous acid to be continued.

Sept. 1st, The bubo has broke. An emollient poultice to be applied, and the nitrous acid to be continued.

Oct. 7th, The sore in the groin is healed. The nitrous acid to be continued. To be discharged in a few days.

CASE XXIII.

Gunner Alderdice was admitted into the Hospital the 13th July, 1798, with phymosis, and several venereal chancres upon the extremity of the glans penis, and prepuce. He was ordered the nitrous acid, from one to two drachms daily. The saturnine lotion to be applied to the fores.

Aug. 6th, Chancres healed. The nitrous acid to be continued.

Aug. 31st, He was discharged cured.

CASE XXIV.

Gunner Graham was admitted into the Hospital the 15th July, 1798, with an incipient bubo in the right groin, and gonorrhœa: he does not recollect to have had any venereal sore. He was ordered the nitrous acid, from one to two drachms daily. The saturnine lotion to be frequently applied.

July 28th, The bubo is painful, and much enlarged. The nitrous acid and the saturnine lotion to be continued.

Sept. 15th, Bubo dispersed; a very small hardness and enlargement of the glands only remain. Gonorrhœa cured. He was discharged the Hospital the 2d October cured.

CASE XXV.

Driver Baker was admitted into the Hospital the 15th July, 1798, with two buboes in the groins, one of which was suppurated, and he had gonorrhœa. He said these complaints began to appear about three weeks ago. He was ordered the nitrous acid, from one to two drachms daily; the saturnine lotion to be frequently applied.

July 23d, The bubo has broke. An emollient poultice was ordered to be applied, and the nitrous acid to be continued.

Oct. 2d, Sore healed. The nitrous acid to be continued.

Oct. 8th, He was discharged cured.

CASE

CASE XXVI.

Gunner Wilson, of apparently a scrophulous habit, was admitted into the Hospital *the 1st August*, 1798, with phymosis and gonorrhœa. He said that he had a large venereal sore upon the glans penis for about a fortnight, and that the swelling of the prepuce came on three days ago. He was ordered the nitrous acid, from one to two drachms daily. The saturnine lotion to be frequently applied.

August 11th, The chancre is healed; gonorrhœa much better. The nitrous acid and saturnine lotion to be continued.

Aug. 18th, He is cured. Being the servant of an officer, he is allowed to go from the Hospital this day, upon condition that he shall persevere with the nitrous acid one week longer.

Sept. 14th, He remained perfectly well.

CASE XXVII.

Driver Stanfield was admitted into the Hospital *the 2d August*, 1798, with chancreous excoriations upon the glans penis and prepuce, and a large venereal sore upon the upper part of the thigh near the groin. He says these complaints began to appear two or three weeks ago. He was ordered the nitrous acid, from one to two drachms daily. The sores to be washed with the solution of nitrated mercury.

Sept.

Sept. 8th, The fores are healed. The nitrous acid to be continued.

Sept. 15th, He was discharged cured.

CASE XXVIII.

Driver Whitworth was admitted into the Hospital *the 18th August*, 1798, with several venereal chancres upon the glans penis : he said these complaints began to appear six weeks ago. He was ordered the nitrous acid from one to two drachms daily. The fores to be washed with the saturnine lotion.

Aug. 31st, A bubo is formed in the groin. The nitrous acid to be continued ; the saturnine lotion to be frequently applied.

Sept. 15th, The chancres are healed ; the bubo is less painful.

Oct. 2d. The bubo is dispersed ; a little hardness of the glands remains. He was ordered to continue with the nitrous acid, and electric sparks to be drawn daily from the groin.

Oct. 9th, He was discharged cured.

*Cases treated by the Oxygenated Muriate of
Manganese.*

CASE XXIX.

Gunner Wardley was admitted into the Hospital the 28th August, 1797, with a venereal chancre upon the prepuce, and phymosis: he said these complaints began to appear three weeks ago. He was ordered a solution of the oxygenated muriate of manganese, from one drop to 20, four times daily, in a glassful of water. The fore to be washed with the saturnine lotion.

Aug. 30th, He has taken three drops of the solution of the oxygenated muriate of manganese four times daily. It has not produced any disagreeable effect. The solution is to be continued.

Aug. 31st, He complains of slight headach; the skin is warm and moist; has stools daily. He was ordered to augment the dose of the solution until some sensible effect be produced.

Sept. 14th, The chancre is healed. He has taken 20 drops of the solution four times daily. A small portion of blood was ordered to be drawn from the arm; the solution to be continued.

Sept.

Sept. 18th, The blood drawn yesterday is covered with a tough coat of a coagulable lymph; its edges are cupped.

Sept. 19th, He was discharged cured.

CASE XXX.

Gunner Fowler was admitted into the Hospital *the 29th August*, 1797, with a chancre upon the penis, and paraphymosis: he said these complaints began to appear three weeks ago. He was ordered two drops of the oxygenated solution of the muriate of manganese four times daily in a little water; the dose to be gradually augmented until some sensible effect shall be produced; a cold saturnine poultice to be applied to the penis.

21st, The inflammation and swelling of the prepuce is diminished; the sore is healing. He has taken 35 drops of the solution four times daily; he has a white tongue; the urine is increased, which is of a pale colour: the camphorated oil to be applied upon the prepuce. To continue with the solution 35 drops four times daily.

26th, The camphorated oil ordered to be discontinued; it has excited too much action upon the thickened prepuce; the solution to be continued, and gradually to increase the dose.

October 29th, He has taken 45 drops of the solution four times daily; the sore is nearly healed; a small portion of blood was ordered to be drawn this day.

30th,

30th, The blood drawn does not shew any diseased appearance. The solution to be continued.

Nov. 20th, The sore is nearly healed : he begins to loath the drops ; he was ordered to discontinue them.

Dec. 6th, The sore is completely healed.

Dec. 12th, He was discharged cured.

P. S. About three weeks after he had been discharged the hospital, he was sent to Chatham ; he said, that while he was upon his march, the cicatrized part became sore and painful, which obliged him to apply to the Ordnance Surgeon at Chatham, who ordered him into the hospital, where he was treated with mercury. In about six weeks, and while he was under cure, he had a sore throat ; this soreness, he said, had been more or less troublesome to him ever since, and that he had eruptions upon his skin. The 6th July, 1798, he came to the hospital at Woolwich ; and upon looking into the throat, a slight tumefaction and redness of the tonsils was to be seen, with excavations in them, as if they had been formerly ulcerated : he was free from headach, or bony enlargements : he was admitted on the day of his arrival, in order to watch the progress of these symptoms ; which gave way to blisters and antimonial aperient medicines : he was discharged the hospital in good health the 31st July, 1798.

N. B. The 2d October, he remained in good health, and perfectly free from venereal symptoms. On the whole, the subsequent part of this man's history, as being venereal, is extremely doubtful.

CASE XXXI.

Driver Duncan was admitted into the Hospital the 16th September, 1797, with several venereal chancres upon the prepuce and glans penis, accompanied with an enlargement of the inguinal glands: he said these complaints began to appear three weeks ago, and that he had not taken any medicine. He was ordered the oxygenated solution of the muriate of manganese, in doses of 15 drops four times daily; the sore to be washed with the saturnine lotion.

24th, The bubo is suppurating; the tongue white: he takes 30 drops of the solution four times a day.

27th, The chancres are almost healed. The patient was obliged to be discharged the regiment, which we lamented, as the progress already made towards a cure was flattering.

Cases treated by the Oxygenated Muriate of Potash.

CASE XXXII.

Gunner Porter was admitted into the Hospital the 10th September, 1797, with several venereal chancres upon the prepuce and glans penis; these complaints, he said, began to appear two weeks ago. He was ordered to take the solution of the oxygenated muriate of manganese, to the quantity of eight drops three times daily; the dose to be slowly augmented; and the sores to be washed with the saturnine lotion.

16th, The patient complains of sore throat; and on examination, we perceive a tumefaction and ulceration of the tonsils. We suspect the history respecting the commencement of the disease to be incorrect, as the ulcers in the throat appear to be venereal. The patient was to omit the use of the preparation of manganese, and take only small doses of bark. The chancres were ordered to be washed with the saturnine lotion.

20th, The ulceration of the tonsils spreads; we can no longer doubt of their nature: he was ordered 10 or 15 drops of the oxygenated solution of the muriate of manganese four times daily; the saturnine lotion to be continued.

24th, The chancres are healed; no alteration

in the throat : he was ordered 20 drops of the solution four times daily ; the dose to be augmented.

Oct. 4th, He has got to 60 drops of the medicine each dose, without any inconvenience : the throat is better : he is to continue as before.

15th, Since last report, he has been in a very fluctuating state, sometimes better, and sometimes worse : he was attacked yesterday with severe pain in the right elbow ; there is some little swelling about the joint, accompanied with pain upon motion. It was agreed that the drops should be omitted, and he was ordered the compound powder of ipecacuanha, from 10 to 15 grains three or four times daily.

22d, The ulceration in the throat appears stationary ; the elbow is perfectly cured. It was agreed to try the effects of the oxygenated muriate of potash two or three weeks ; and provided no particular benefit was derived from that substance, then we should have recourse to mercury. He was ordered 10 grains of the muriate four times daily ; the dose to be gradually augmented.

Nov. 3d, The fore throat better : he has taken 20 grains of the salt four times a day, with which he is to continue.

6th, He has inflammation of the right eye, with headach ; the skin is hot ; the pulse is quick and firm : he was ordered to lose eight ounces of blood
from

from the arm ; to take a dose of purging salts, and apply the saturnine lotion to the eye; and the oxygenated muriate to be omitted.

7th, The inflammation of the eye is no better. A small blister to be applied behind the ear, and to take four grains of antimonial powder at bedtime.

9th, The eye is painful, and the inflammation of it continues : the blood-letting, cathartic, and antimonial powder, to be repeated.

18th, The opthelmy is removed ; the ulceration of the tonsils have spread since the salt was omitted : he was ordered 10 grains of it again four times daily ; and the dose to be gradually augmented.

26th, The throat is better : he takes 25 grains of the salt four times in the day. The tongue is white. The medicine to be continued.

Dec. 18th, Throat nearly well : he takes 160 grains of the oxygenated muriate daily, with which he is to continue.

20th, A small fresh ulcer began to appear since yesterday : he was ordered to gargle his throat with a strong decoction of oak bark.

Jan. 13th, 1798. He was discharged the Hospital cured.

CASE XXXIII.

Driver Norris was admitted into the Hospital *the 27th October, 1797*, with chancrous excoriations upon the prepuce and corona glandis, and an incipient bubo in each groin, which are painful : he said he had not taken any medicine : he was ordered the oxygenated muriate of potash, from 10 to 20 grains four times daily ; the sores to be washed with the saturnine lotion.

Nov. 3d, The bubo in the right groin is suppurating ; an emollient poultice to be applied : he was ordered to continue the salt in doses of 20 grains four times daily.

20th, The bubo has broke ; the tongue is very white. Continue with the medicine as before.

Jan. 14th, 1798, The sore in the groin is not yet healed : the oxygenated muriate of potash to be continued.

March 12th, He was discharged cured.

CASE XXXIV.

Driver Edge was admitted into the Hospital *the 30th September, 1797*, with venereal chancres upon the prepuce, and with phymosis : he had a suppurated bubo in each groin : he said these complaints began to appear about three weeks ago : he was ordered the oxygenated muriate of potash, from 10
to

to 25 grains four times daily; the fores to be washed with the saturnine lotion.

Oct. 17th, Some of the chancres are healed: blood drawn to day was covered with a firm and tough coat of coagulable lymph.

22d, The buboes are broke; the salt to be continued.

31st, Sores in the groins healed; the salt to be continued.

Nov. 26th, The chancres, although they are slow in healing, yet they appear healthy; he was ordered to take 25 grains of the oxygenated muriate four times daily; the fores to be washed as usual.

Dec. 16th, He takes 35 grains of the salt four times a day; the fores heal very slowly; the tongue is very white: he is to continue with the remedy, with which he is to join half an ounce of bark daily.

28th, There is very little change in the fores: he was ordered to apply the oxygenated ointment, prepared with one drachm of the oxygenated muriate of potash, and two ounces of lard: the salt to be continued.

Jan. 9th, 1798, The fores are much better since the application of the oxygenated ointment; it produces, for some minutes, a smarting pain, which wears off: he is to continue the ointment, and the internal use of the salt.

20th, A portion of the urine has been evaporated ; it was found to contain a quantity of the oxygenated salt undecomposed. It was suggested to give a few drops of the muriatic acid, in a little water, after each dose of the medicine. The chancres are healing rapidly.

Feb. 1st, The chancres are healed. Continue with the bark and oxygenated muriate of potash.

7th, He was discharged cured.

CASE XXXV.

Gunner Thompson was admitted into the Hospital the 31st October, 1797, with several venereal chancres upon the penis, and a painful enlargement of the right inguinal glands: he said these complaints began to appear two weeks ago: he was ordered the oxygenated muriate of potash, 10 grains four times daily ; the dose to be gradually increased ; the fores to be washed with the saturnine lotion.

Dec. 20th, He has got to the dose of 40 grains of the oxygenated muriate four times a day ; this dose has evidently excited headachs, it is therefore to be diminished.

26th, The fores are healed : he is taking 35 grains of the salt four times a day without inconvenience.

Jan. 4th, 1798, He was discharged cured.

CASE XXXVI.

Gunner Stewart was admitted into the Hospital the 5th November, 1797, with phymosis, and several chancres upon the prepuce: he was ordered the oxygenated muriate of potash from 10 to 35 grains daily; the fores to be washed with the saturnine lotion.

Dec. 16th, The patient takes 35 grains of the oxygenated muriate four times daily, with which he is to continue. The chancres are healed. As the patient appears weak and irritable, the augustura bark was ordered to be joined with the salt. He is directed a more nourishing diet.

Jan. 1st, 1798, He was discharged in good health,

CASE XXXVII.

Gunner Walden was admitted into the Hospital the 9th November, 1797, with phymosis, accompanied by a copious purulent discharge from between the glans penis, and prepuce, and, also, gonorrhœa. We suspected concealed chancres. He was ordered the oxygenated muriate of potash, from 10 to 30 grains four times daily; the saturnine lotion to be frequently applied.

Nov. 19th, The swelling and inflammation of the prepuce abated; there are several venereal chancres

chancres upon the prepuce. The oxygenated muriate, and the saturnine lotion, to be continued.

Dec. 16th, The chancres are healed. Being the servant of an officer : he was this day discharged the Hospital, but desired to give us notice if he should have any relapse.

CASE XXXVIII.

Driver Wood was admitted into the Hospital *the 17th November, 1797*, with a fore in the groin from a bubo, which had broke some days ago, and a suppurating one in the other groin : he said these complaints began to appear four weeks ago, at which time he had a chancre. We suspected him to have taken mercury, as a portion of blood drawn exhibited strong marks of inflammation. He was ordered the oxygenated muriate of potash, from 10 to 25 grains four times daily. An emollient poultice to be applied to each groin.

Dec. 16th, Sore healed ; bubo subsided. The oxygenated muriate to be continued.

23d, He was discharged cured.

CASE XXXIX.

Driver Benfield was admitted into the Hospital *the 9th December, 1797*, with phymosis, and a great purulent discharge. We suspected concealed chancres. He was ordered the oxygenated muriate of potash,

potash, from 10 to 30 grains four times daily. The saturnine lotion to be frequently used.

Dec. 15th, The swelling and inflammation of the prepuce abated; there are several venereal chancres upon the glans penis. The salt to be continued.

Dec. 20th, He has been taking for some days past 140 grains of the oxygenated muriate daily: he complains of headach, has a very white tongue; the chancres are healing. The salt and application to be continued.

22d, Headach continues rather severe; the pulse quick, full, and firm; perspires freely; the tongue white; sores are healing. The dose of the oxygenated muriate was ordered to be diminished to 120 grains in the day.

Jan. 6, 1798, The chancres are healed. Some florid eruptions began to appear yesterday upon the face, back, &c. We have noticed similar eruptions to have appeared upon another patient, when the salt had apparently produced much increased action of the system; but these disappeared in a few days. We shall watch the progress of the present eruptions. The salt to be continued.

7th, He still complains of headach. The medicine to be continued.

Feb. 2d, The eruptions are completely removed. He was discharged the Hospital cured.

May 13th, He was re-admitted into the Hospital
with

with a violent inflammation of the left eye. Upon examining his body, we discovered the skin in many places covered with eruptions—*Herpes Farinosus*. Besides these, there were venereal eruptions intermixed with the former; the two species of eruptions appeared distinctly marked. He said, that a few weeks after he had been discharged the Hospital, his body was beset with many spots; these went away in a little time, and others began to appear; the inflammation of the eye had been only of a few days standing. Leeches were ordered to be applied to the temples, and afterwards a blister. The saturnine lotion to be frequently used.

20th, The inflammation of the eye is relieved; the eruptions continue. It was suggested to give the oxygenated muriate of potash, from 10 to 25 grains four times daily. The saturnine lotion to be continued.

June 6th, The eruptions are disappearing, and throw off branny scales. The salt to be continued.

June 10th, The eye is more painful; the inflammation is increased. Leeches were ordered to be applied to the temples, and the salt to be continued.

20th, A portion of the urine was examined yesterday; the whole of the hundred grains which he takes daily was found to be decomposed.

26th, The inflammation of the eye much abated;

ed; the eruptions have nearly disappeared. The salt to be continued.

July 12th, Since last report, the state of the eye has been fluctuating, sometimes better, sometimes worse; the inflammation is now completely removed; vision is perfect. On account of the weak, and irritable state of the patient, we joined the use of the muriatic tincture of iron, with the oxygenated muriate of potash, which plan seems to have been of service: his strength and appetite is improved: he was now allowed to go to the convalescent barrack, and walk out daily.

20th, He was this day discharged, in good health, and remained so, three months afterwards.

CASE XL.

Gunner M^cCurry was admitted into the Hospital *the 15th December, 1797*, with several recent venereal chancres upon the glans penis and prepuce: he complained of some tenderness and pain in the groins. He was ordered the oxygenated muriate of potash, 10 grains four times daily. The saturnine lotion to be applied to the fores.

Dec. 20th, The chancres are healed. The salt to be continued.

25th, He was discharged apparently cured.

CASE XLI.

Driver Hough was admitted the 27th December, 1797, with a very small recent venereal chancre upon the glans penis. He was ordered the bread pills, and the sore to be washed with the saturnine lotion.

Jan. 14th, 1798, There are now two chancres, which have been gradually enlarging since his admission, although the usual topical application has been attentively employed ; the chancres are each nearly the size of a silver sixpence, and the inguinal glands are painful. We can no longer trust the cure to local applications alone. He was ordered the oxygenated muriate of potash, from 10 to 20 grains four times daily. The saturnine application to be continued.

17th, He complains of pain and scalding when he passes his urine ; a portion of it being examined, was found to contain undecomposed oxygenated muriate of potash, which was ordered to be continued, but to take a few drops of muriatic acid after each dose, the more effectually to decompose this substance, as all acids do this readily.

Feb. 20th, The chancres are slow in healing ; an ointment composed of calcined zinc and lard was ordered to be applied. The salt to be continued.

April 4th, He was discharged cured.

CASE

CASE XLII.

Gunner Petrie was admitted into the Hospital the 3d January, 1798, from Chatham, with a large painful bubo in the right groin, which he said began to appear 12 days ago: he did not recollect to have had any chancre; he had used mercury, both externally and internally; the mouth was still sore. He was ordered the oxygenated muriate of potash, from 15 to 30 grains four times daily, and the saturnine lotion frequently to be applied to the bubo.

Jan. 11th, The bubo very large and painful; leeches were ordered to be applied; after which the saturnine lotion to be continued.

14th, There is an evident fluctuation in the bubo. The salt to be continued, and 30 drops of laudanum to be taken at bed-time.

Feb. 1st, The bubo has broke. An emollient poultice to be applied; the salt and laudanum to be continued.

April 1st, The sore in the groin heals very slowly. The bark was ordered to be joined with the salt.

May 7th, He was discharged cured.

CASE XLIII.

Driver Handly was admitted into the Hospital, the 6th January, 1798, with venereal chancres upon the

the glans penis. The sores were ordered to be dressed with the oxygenated ointment; to take from 10 to 30 grains of the oxygenated muriate of potash four times daily.

Jan. 14th, There is an incipient bubo in each groin; the sore is nearly the same. The ointment and the oxygenated muriate to be continued.

16th, The ointment begins to excite pain; it is to be omitted to day; the salt to be continued; the sore to be washed with the saturnine lotion.

Feb. 1st, The sore is painful; prepuce much swelled, and inflamed. He was ordered to lose a few ounces of blood, to take a dose of purging salts, and to omit the muriate.

3d, The blood drawn is fizy; the blood-letting and purge to be repeated; the saturnine lotion to be continued.

4th, The inflammation and swelling much abated; the sore heals. He was ordered the salt again.

20th, The chancres are almost healed. The salt and applications to be continued.

March 16th, He was discharged the Hospital cured.

CASE XLIV.

Driver Mitchell was admitted into the Hospital *January 6th*, 1798, with a large venereal chancre upon the glans penis: he said these complaints began to appear several days ago, and had not
taken

taken any medicine. He was ordered the oxygenated muriate of potash, from 10 to 35 grains four times daily. The oxygenated ointment to be applied to the fore.

Jan. 14, The ointment produces a slight smarting pain in the ulcer. The salt and ointment to be continued.

Feb. 1st, The chancre is painful, accompanied with inflammation. The oxygenated ointment to be omitted. He was ordered to lose some blood, to take a dose of the purging salts, and the saturnine lotion to be applied.

4th, The chancre is much better. The salt to be continued.

9th, The chancre is healing. The salt and the saturnine lotion to be continued.

20th, The chancre is almost healed. The salt and lotion to be continued.

March 9th, He was discharged cured.

CASE XLV.

Driver Simmons was admitted into the Hospital the 8th January, 1798, with a venereal chancre upon the frænum, and an incipient bubo in the left groin. He was ordered the oxygenated muriate of potash, in doses of 10 grains four times daily; and the fore to be washed with the saturnine lotion.

Feb. 20th, The chancre is healed; the bubo sub-

P p

fides.

fides. The salt to be continued; and a gum plaister to be applied to the indurated gland.

March 7th, He was discharged cured.

CASE XLVI.

Driver Bullin was admitted *the 12th January, 1798*, with phymosis, accompanied by a copious purulent discharge from the penis. We suspected concealed chancres. The inguinal glands were enlarged, and painful. He was ordered the salt, from 10 to 20 grains four times daily; and the saturnine lotion to be frequently applied.

Jan. 16th, The swelling of the prepuce is abated; there are several venereal chancres upon the glans penis. The oxygenated muriate of potash and the saturnine lotion to be continued.

Feb. 18th, The chancres are healed; and the tumefaction of the glands is removed. The salt to be continued.

21st, He was discharged the Hospital cured.

CASE XLVII.

Driver Lunsdale was admitted into the Hospital *the 19th January, 1798*, with a venereal chancre upon the glans penis, at the extremity of the urethra; also pain and tenderness of the inguinal glands. The oxygenated muriate of potash was ordered, from 15 to 30 grains four times a day, and the oxygenated ointment to be applied to the sore.

Feb.

Feb. 8th, The chancre is healed. The salt to be continued.

March 3d, He was discharged cured.

CASE XLVIII.

Gunner Hamil was admitted *the 20th January*, 1798, with a recent venereal chancre upon the corona glandis, and also gonorrhœa. He was ordered the oxygenated muriate of potash, in doses of 15 grains four times daily; and the saturnine lotion to be applied to the fore.

Feb. 8th, The chancre is healed: he complains of much pain and smarting when he passes his urine; a portion of which being examined, the oxygenated muriate of potash was, however, found to be completely decomposed; but it contained a large proportion of the *common muriate of potash*.

16th, He was discharged cured.

CASE XLIX.

Gunner Thornton was admitted into the Hospital *the 20th February*, 1798, with a large venereal chancre upon the prepuce, and gonorrhœa; also an incipient bubo in the right groin. He said these complaints began to appear three weeks ago. He was ordered the oxygenated muriate of potash, in doses of 15 grains four times daily; and the sores to be washed with the saturnine lotion.

March 7th, The chancre is healed. The salt to be continued.

April 9th, He was discharged cured.

CASE L.

Gunner Welder was admitted into the Hospital *the 17th March*, 1798, with venereal chancres, and several warty excrescences upon the glans penis, and in the perinæum; having also the inguinal glands rather enlarged. He was ordered the oxygenated muriate of potash, 20 grains four times daily; and the fores to be washed with the saturnine lotion.

May 24th, He was discharged cured.

CASE LI.

Gunner Closssey was admitted into the Hospital *the 15th March*, 1798, with several venereal chancres upon the prepuce, and a suppurated bubo in the left groin. He was ordered the oxygenated muriate of potash, 20 grains four times daily; and the fores to be washed with the saturnine lotion.

April 1st, The sore in the groin and the chancres are healed. The salt to be continued.

9th, He was discharged cured.

CASE LII.

Gunner Itch was admitted into the Hospital *the 28th March*, 1798, with a large sore upon the scrotum, nearly three quarters of an inch in diameter; which

which resembled a venereal chancre. The patient denied having had any other venereal sore or bubo. He was ordered the bread pills; the sore to be washed with the solution of nitrated mercury, and dressed with common ointment.

May 5th, The sore is healed: two or three days ago, a few eruptions began to appear upon his forehead, &c. During last night many more broke out upon the breast and arms; these we are convinced are venereal eruptions: he has sore throat, the tonsils are slightly inflamed, with an excoriated or apthous appearance. We conceived a fairer case could not offer to try the effects of the new remedies. He was accordingly ordered the oxygenated muriate of potash, from 15 to 20 grains four times daily.

12th, The sore throat is cured; the eruptions are going off, leaving a copper-coloured stain upon the skin. The oxygenated muriate to be continued.

July 6th, He was discharged cured.

CASE LIII.

Driver Irwin was admitted into the Hospital *the 19th March*, 1798, with a large venereal sore upon the penis; having also the inguinal glands enlarged. He said these complaints began to appear three weeks ago. He was ordered the oxygenated muriate of potash, from 15 to 25 grains four times daily; and the sore to be washed with the saturnine lotion.

March 5th, The chancre is almost healed. He has taken 25 grains of the salt four times daily. A few days since some florid eruptions began to appear upon his face, breast, &c. these are nearly gone, but some fresh ones have appeared. The oxygenated muriate to be continued.

May 12th, A small quantity of the oxygenated muriate of potash is found undecomposed in the urine; the eruptions are nearly gone; they leave a copper-coloured stain upon the skin. The salt to be continued.

27th, The sore is perfectly healed; the salt is now found to be decomposed; and it is ordered to be continued.

June 16th, He was discharged cured.

CASE LIV.

Gunner Pidd admitted into the Hospital *the 19th March*, 1798, with phymosis, and a copious purulent discharge from the penis. We suspected concealed chancres. He was ordered the oxygenated muriate of potash, 20 grains four times daily; and the saturnine lotion to be applied frequently.

March 24th, The swelling of the prepuce is abated; there are several venereal chancres upon the glans penis. The salt to be continued.

May 2d, He was discharged cured.

CASE LV.

Gunner Johnstone, 4th battalion, was admitted into the Hospital *the 12th May*, 1798, with recent venereal chancres upon the glans penis and prepuce. He was ordered the oxygenated muriate of potash, 15 grains four times daily; and the sores to be washed with the saturnine lotion.

May 30th, The chancres are healed. The salt to be continued.

June 9th, He was discharged cured.

CASE LVI.

Driver Whitehead was admitted into the Hospital *the 4th August*, 1798, with venereal sore throat, having a large deep ulcer in the right tonsil, accompanied by venereal eruptions upon his hands. He said, that about four months ago he had a venereal chancre upon the penis, and an enlargement of the inguinal glands: he took some mercurial pills, and applied an ointment to the sores, which healed in about eight days; he then left off the mercury: he also said, that about five weeks ago, he first began to be affected with sore throat; and about four weeks since, the eruptions began to appear upon his hands. He was ordered the oxygenated muriate of potash, from 15 to 35 grains four times daily; and the throat to be gargled with milk and water.

Aug. 31st, The sore throat and the eruptions are

cured. The salt to be continued, in doses of 35 grains four times daily.

Sept. 12th, He was discharged cured.

CASE LVII.

Driver Drummond was admitted into the Hospital *the 9th August*, 1798, with a large deep venereal chancre in the glans penis: he said that it began to appear about seven weeks ago. He was ordered the oxygenated muriate of potash, from 15 to 35 grains four times daily; and the fore to be washed with the saturnine lotion.

Aug. 18th, He complains of sore throat; the tonsils are swelled, and inflamed, with small ulcerations. The salt and saturnine lotion to be continued.

Aug. 24th, The ulcers in the throat spread. The salt to be continued.

31st, The chancre is healed; the sore throat is better. The salt to be continued, in doses of 35 grains four times daily.

Oct. 11th, He was discharged cured.

CASE LVIII.

Gunner Cockshaw was admitted into the Hospital *the 18th August*, 1798, with a painful bubo in the left groin, which began to appear about five weeks ago: he said, that about two months since he had a small venereal chancre upon the frænum, to
which

which he had applied blue vitriol, and it healed in a few days; he had not taken any medicine. He was ordered the oxygenated muriate of potash, 15 grains four times daily; and the saturnine lotion to be applied frequently.

Sept. 8th, He was discharged cured.

Cases treated by the Nitrous Acid and Oxygenated Muriate of Potash.

CASE LIX.

Gunner Johnstone was admitted into the Hospital the beginning of *June*, 1797, from the West-Indies, where he had been several years; he had been repeatedly attacked with intermittent fever previous to his coming home: he had a considerable fulness, with tension in the regions of the liver and spleen, a general debility, loss of appetite, &c. Mr. Scott, at Bombay, having asserted the good effects that he had derived in scirrhus affections of the liver from the nitrous acid, we were induced to give it a trial; and he was ordered from half a drachm to two drachms daily, with which he continued tolerably regular for nearly eight weeks, and derived apparently much benefit from it; his strength being much improved, and the tension and fulness about the region of the liver and spleen diminished. He was discharged the Hospital,

Hospital, in apparent good health, *the 15th August, 1797.*

Aug. 21st, He was re-admitted into the Hospital, with venereal chancres upon the prepuce and glans penis, which began to appear, he said, the 4th June, 1797. He acknowledged having concealed his present complaints while he had been in the Hospital: and that when he went from it the 15th August, the sores were almost healed, which induced him to conceal his venereal complaints; as he observed that he was taking the same acid as the rest of the venereal patients were prescribed; however, while he was out of doors, and upon duty, the sore became so painful, inflamed, and enlarged, that he was induced to make his case known.

Aug. 22d, He was ordered the nitrous acid, from one to two drachms daily; and the sores to be washed with the saturnine lotion.

Sept. 17th, The chancres are nearly healed; he complains of pains in his left leg; there is a slight swelling upon the tibia. The nitrous acid to be continued, and 30 drops of laudanum to be taken every night at bed-time.

20th, The chancres are healed: he complains of general pain, resembling rheumatism. The nitrous acid was ordered to be omitted; and he was desired to take a few doses of the compound powder of ipecacuanha.

Sept.

Sept. 24th, He is so free from complaints, that he is to be transferred to the convalescent barracks.

Oct. 3d, He has severe headaches, accompanied with febrile symptoms. He was ordered to lose some blood, and the compound powder of ipecacuanha to be repeated.

7th, The headach continues; he has a swelling upon the forehead. He was ordered the nitrous acid as before.

Nov. 29th, The patient has been sometimes better, sometimes worse, since last report. Nodes have formed upon the tibia, clavicle, and upper part of the sternum; the node upon the forehead remains. He was ordered the oxygenated muriate of potash, from five to twenty grains four times daily; the bark to be joined with it; and fifty drops of laudanum to be taken every night at bedtime.

Dec. 22d, The nodes are diminished. The bark, laudanum, and the oxygenated muriate of potash to be continued.

Jan. 14th, 1798, The nodes are nearly gone. The salt, bark, and laudanum, to be continued.

April 5th, He was discharged the Hospital cured; but allowed to go into the country to facilitate the recovery of his usual strength.

Aug. 31st, He returned to the regiment much improved in his general health.

CASE LX.

Driver Collins was admitted into the Hospital the 21st August, 1797, with a venereal chancre upon the prepuce: he said it began to appear two weeks ago; and he had not taken any medicine. He was ordered the nitrous acid, from one to three drachms daily; and the fore to be washed with the saturnine lotion.

Sept. 30th, There is very little change in the state of the fore. We have reason to believe the acid has not been taken regularly. The nitrous acid and saturnine lotion to be continued.

Oct. 15th, The chancre does not heal. He was ordered the oxygenated muriate of potash; and a linseed meal poultice to be applied to the fore.

16th, The fore is painful, and ill-conditioned. He was ordered repeated doses of laudanum, and the bark to be taken as freely as the stomach would bear. The carbonic acid gas to be applied twice or thrice daily.

26th, The fore much better. The bark to be omitted, on account of diarrhœa; but the laudanum and the salt to be continued.

Nov. 5th, The chancre is healing; there are many florid eruptions upon his breast, back, and face. The dose of the oxygenated muriate of potash to be diminished, and to take only 10 grains four times

times a day ; the carbonic acid, and other topical applications to be continued.

Nov. 7th, The fore is clean, and free from pain. The gas was ordered to be omitted ; the solution of nitrated mercury to be applied to the fore ; and the salt to be continued as before.

26th, The fore heals rapidly ; and the eruptions upon the skin are entirely removed. He was ordered to continue the salt, in doses of 25 grains four times daily.

Dec. 1st, The fore is completely healed : the salt appears to have produced much increased action in the system ; as a portion of blood drawn yesterday had its surface covered with a tough cupped coat of coagulable lymph ; it is however to be continued.

Jan. 12th, 1798, He was discharged cured.

CASE LXI.

Gunner Varley was admitted into the Hospital the 1st October, 1797, with several venereal chancres upon the prepuce, and phymosis ; and also an incipient bubo in the right groin. He was ordered the solution of the oxygenated muriate of manganese, from 10 to 60 drops four times daily ; and the sores to be washed with the saturnine lotion.

Oct. 10th, The glands in both groins are painful, and enlarged. The drops have produced a little sickness

sickness this morning, in the dose of 55 drops four times daily.

Oct. 17th, The chancre is foul and unhealthy ; and the prepuce is much swelled, accompanied with chordee. He was ordered 40 drops of laudanum at bed-time ; the solution of oxygenated muriate of manganese and the saturnine lotion to be continued.

22d, The chancres are enlarged. He was ordered the nitrous acid from one to three drachms daily ; the solution of oxygenated muriate of manganese to be omitted ; the laudanum and topical application to be continued.

23d, The chancre has a dark livid appearance. He was ordered to continue the nitrous acid ; and the carbonic acid gas to be applied twice daily.

29th, The chancre has a more healthy appearance : the acid produces nausea and griping, it is therefore to be omitted, and the common wax ointment to be applied to the sore.

30th, He was ordered the oxygenated muriate of potash, from 10 to 25 grains four times daily ; and the laudanum to be continued.

Nov. 25th, The sores have healed very rapidly lately ; he has had headach, a firm quick pulse, a white tongue, and a slight sore throat, with the tonsils tumefied and inflamed. He was ordered the volatile camphorated liniment to the outside of the throat,

throat, to lose 10 ounces of blood, and to take four grains of the antimonial powder at bed-time.

Nov. 27th, He has a deep ulcer in the right tonsil. It was ordered, that the bark, and the salt, with the saturnine lotion, should be continued.

Dec. 6th, The chancres are completely healed ; and the fore throat is much better. The bark and the oxygenated muriate of potash to be continued.

12th, He was ordered to gargle his throat with a decoction of oak bark, and to swallow one pint of it daily in place of the Peruvian bark ; the salt to be continued.

Jan. 1st, 1798, The left tonsil is enlarged, but not ulcerated ; a small blister is directed to be applied to the throat ; the oak bark and the oxygenated muriate to be continued.

29th, He was discharged cured.

CASE LXII.

Gunner Lishman was admitted into the Hospital the 25th January, 1798, with a large and deep venereal chancre upon the glans penis, at the extremity of the urethra ; he had also phymosis : he said these complaints began to appear several weeks ago. He was ordered the nitrous acid, from one to three drachms daily ; the sore to be dressed with the oxygenated ointment.

Feb. 4th, The chancre is healing ; the ointment
does

does not give pain ; the nitrous acid to be continued.

Feb. 11th, This morning the patient imprudently forced back the prepuce, and has brought on paraphymosis ; the fore is painful, and does not look healthy ; the saturnine lotion to be very frequently applied ; and he was ordered repeated doses of laudanum, and to keep in bed.

12th, The inflammation and swelling are increased, the fore is also foul and painful. Fourteen ounces of blood were directed to be drawn from the arm ; the saturnine lotion to be continued ; the carbonic acid gas to be applied twice daily, from 15 to 20 minutes each time ; and the laudanum to be taken freely.

19th, The fore continues to spread ; the inflammation extends upon the penis. He was ordered the oxygenated muriate of potash, 20 grains four times daily ; the bark and the laudanum to be taken freely.

20th, He has passed a better night ; the inflammation is abated. He was ordered to continue his medicines and applications as yesterday.

21st, The fore is painful and enlarged. He was ordered 25 grains of the oxygenated muriate four times daily, and to continue with the other medicines and applications as before.

24th, The fore is more easy ; a slough from the ulcer was removed with the dressings this morning.

ing. The wax ointment to be applied; the bark, laudanum, and oxygenated muriate, to be continued.

March 1st, The sore has a healthy appearance: the medicines to be continued; and the sore to be washed with the solution of nitrated mercury.

24th, The sore is healed; he has several venereal eruptions upon his face, breast, and arms: the bark and the salt to be continued.

April 9th, The eruptions are removed; but they have left a dark coloured mark upon the skin. He was discharged the Hospital.

May 18th, 1798, Several of the venereal patients who had been discharged some time ago, were ordered to the Hospital to be examined, in order to ascertain whether they remained free from relapse, &c. *Gunner Lisheman* was among this party. I found upon various parts of his body a fresh crop of eruptions, similar to those which he had while under cure: he said these began to appear several weeks ago; and that he was otherwise in good health: he was admitted into the Hospital on the evening of *the 18th May*, 1798, and ordered the oxygenated muriate of potash, from 15 to 25 grains four times daily.

June 9th, The eruptions have disappeared, except two spots on the elbow: he has neither nodes, or sore throat. The salt to be continued.

July 4th, He was discharged cured.

CASE LXIII.

Driver Christley was admitted into the Hospital the 12th February, 1798, with a large ill-conditioned ulcer upon the pubis ; he had neither chancres nor bubo ; but we suspected the sore to be venereal. It was ordered to be dressed with wax ointment.

Feb. 16th, The sore is no better. He was ordered the nitrous acid, from one to a drachm and half daily.

March 23d, The sore is healed.

28th, He was discharged.

May 20th, He accompanied the party of men brought to the Hospital for examination : he had several venereal eruptions upon the arms, &c. and fore throat, with a small ulcer upon each tonfil : he is become rather deaf ; and complains of pains in his legs : he was ordered the oxygenated muriate of potash, from 15 to 25 grains four times daily.

June 6th, The eruptions have left a copper-coloured stain upon the skin. The salt to be continued.

June 26th, He was discharged cured.

Cases treated by the new Remedies, and Mercury.

CASE LXIV.

Gunner Yoaly was admitted into the Hospital *the 27th December, 1797*, with several venereal chancres upon the frænum and corona glandis. He was ordered one grain of calcined mercury daily, with 10 grains of the oxygenated muriate of potash four times a day; and the fore to be washed with the saturnine lotion.

Jan. 4th, 1798, The chancres are healing. The calcined mercury and oxygenated muriate to be continued.

March 19th, The chancres are healed. The oxygenated muriate of potash and mercury to be continued.

28th, He was discharged cured.

CASE LXV.

Gunner M^cKey was admitted into the Hospital *the 27th December, 1797*, with a large bubo in the right groin; he had neither chancres nor gonorrhœa. He was ordered one grain of calcined mercury twice daily, and 10 grains of the oxygenated muriate of potash four times a day; and the saturnine lotion to be frequently applied.

Jan. 6th, 1798, The bubo suppurated. The calcined mercury; and oxygenated muriate, in doses of 20 grains four times daily, to be continued.

12th, The bubo has broke. A poultice to be applied; and the medicines to be continued.

Feb. 20th, His mouth rather fore. The medicines to be continued.

23d, He was discharged cured.

CASE LXVI.

Gunner Porter was admitted the 9th June, 1798, with an incipient bubo in each groin: he said that he had a venereal chancre upon the prepuce eight days; which is now almost healed. He was ordered one grain of calcined mercury, with one drachm of the nitrous acid daily.

June 16th, The chancre is healed; the buboes are nearly subsided. The medicines to be continued.

July 4th, He was discharged cured.

CASE LXVII.

Gunner Conde was admitted into the Hospital the 9th June, 1798, with venereal chancres upon the frænum: he said it began to appear eight days ago. He was ordered to wash the fore with the saturnine lotion, and to take a dose of purging salts.

June 16th, The chancre is enlarged and painful, accompanied with a swelling of the inguinal glands. He was ordered one grain of calcined mercury, with one drachm of the nitrous acid daily.

29th,

29th, The inguinal glands and chancre are better; he has not any forenefs of the mouth. The medicines and application to be continued.

July 28th, The chancre is much better; the mouth is rather fore. The medicines and application to be continued.

Aug. 11th, The chancre is healed. The mercury and nitrous acid to be continued.

Sept. 8th, He was discharged cured.

CASE LXVIII.

Driver Tayler was admitted into the Hospital the 15th June, 1798, with venereal chancres upon the glans penis and frænum, and an incipient bubo in each groin: he said these began to appear two weeks ago. He was ordered one grain of calcined mercury, with one drachm of the nitrous acid daily; and the fores to be washed with the saturnine lotion.

Aug. 5th, The chancres are completely healed; and the buboes have subsided: the medicines are ordered to be continued.

Aug. 17th, He was discharged cured.

CASE LXIX.

Gunner Partington was admitted into the Hospital the 18th June, 1798, with several venereal chancres upon the frænum and prepuce: he said these began to appear eight days ago, and that he

had not taken any medicine. He was ordered one grain of calcined mercury, with one drachm of the nitrous acid daily ; and the fore to be washed with the saturnine lotion.

July 28th, The chancres are healed. The medicines to be continued.

Aug. 7th, This patient walked out with the convalescents; and he had a fresh connection, by which he received a recent venereal chancre upon the frænum; he acknowledged the fact, and said, that he had flattered himself, by continuing the medicine, no harm would have ensued. He was ordered to continue with the mercury and nitrous acid.

23d, The inguinal glands are swelled and painful. The mercury and nitrous acid to be continued.

31st, The bubo has broke. The medicines to be continued.

Sept. 15th, The chancre is healed ; the fore in the groin is almost well ; the mouth is not sore. The mercury and nitrous acid to be continued.

22d, The fore is healed. The mercury and nitrous acid to be continued.

Oct. 7th, He was discharged cured.

CASE LXX.

Gunner Simpson was admitted into the Hospital the 4th June, 1798, with a suppurated bubo in the right groin and a venereal chancre upon the prepuce :

puce : he said these complaints began to appear eight days ago ; and that he had not taken any medicine. He was ordered one grain of calcined mercury, with one drachm of the nitrous acid daily ; and the fore to be washed with the saturnine lotion.

June 16th, The chancre is healed ; the bubo has broke. The mercury and nitrous acid to be continued.

Aug. 15th, The fore is healed ; the medicines to be continued.

22d, He was discharged cured.

CASE LXXI.

Driver Grant was admitted into the Hospital *the 20th June, 1798*, with venereal chancres upon the prepuce and glans penis ; and he had also an incipient bubo in the right groin. He was ordered one grain of calcined mercury, and one drachm of the nitrous acid daily.

July 1st, The chancres are healed ; the bubo is suppurating. The medicines to be continued.

8th, The bubo has broke. The medicines and poultice to be continued.

28th, The fore in the groin is healed. The mercury and nitrous acid to be continued.

Aug. 11th, This patient walked out with the convalescents, and had a fresh connection with an infected person, from which he has got two recent venereal chancres upon the corona glandis. He

was ordered to continue with the calcined mercury and nitrous acid ; and the fores to be washed with the saturnine lotion.

Sept. 22d, The chancres are healed. The mercury and nitrous acid to be continued.

29th, He was discharged cured.

CASE LXXII.

Gunner Steward was admitted into the Hospital *the 16th January*, 1798, with phymosis, accompanied with much inflammation and severe pain of the penis. I suspected concealed chancres ; he had a white tongue, full and hard pulse, with a hot and dry skin. He was ordered to lose blood, and to take a dose of purging salts ; which were to be repeated as circumstances might require ; the saturnine lotion to be frequently applied ; and to receive a full dose of laudanum two or three times during the day. The inflammation and swelling have abated, a very large and deep ill-conditioned chancre is found on the glans penis. He was ordered two grains of calomel twice daily, with 15 grains of the oxygenated muriate of potash four times a day ; and the dose of the latter to be gradually increased.

February 4th, The chancre is healing. The calomel, with the oxygenated muriate, to be continued ; and the fore to be washed with the solution of nitrated mercury.

24th,

24th, The chancre is healed. The calomel and the oxygenated muriate to be continued.

March 3^d, He was discharged cured.

CASE LXXIII.

Driver Seager was admitted into the Hospital the 19th May, 1798, with a venereal chancre upon the penis. He was ordered 15 grains of the oxygenated muriate of potash four times daily; and the fore to be washed with the saturnine lotion.

June 1st, The fore is not better. The oxygenated muriate to be continued, and one grain of calomel to be taken twice daily.

June 20th, The fore is healed.

25th, He was discharged cured.

CASE LXXIV.

Driver Duncan, sen. was admitted the 20th May, 1798, with a large venereal chancre upon the penis: he says it began to appear three weeks ago. He was ordered 15 grains of the oxygenated muriate of potash four times daily; and the fore to be washed with the solution of nitrated mercury.

June 3^d, The chancre does not heal. He was ordered one grain of calomel twice daily. The salt to be continued.

June 20th, The chancre is almost healed. The medicines and applications to be continued.

July 14th. He was discharged cured.

CASE

CASE LXXV.

Driver Twigg was admitted *the 23d May, 1798*, with several venereal chancres upon the glans penis and the prepuce. He was ordered the oxygenated muriate of potash, 15 grains four times daily; and the fore to be washed with the saturnine lotion.

June 1st, The chancres heal very slowly. The salt to be continued; and one grain of calomel to be taken twice daily.

9th, The chancre is healed; he has gonorrhœa. The calomel and oxygenated muriate to be continued; the mouth is rather sore; he was ordered an astringent injection.

July 11th, He was discharged cured.

CASE LXXVI.

Driver Serjeant was admitted into the Hospital *the 18th June, 1798*, from Brentwood, in Essex, with venereal chancres upon the glans penis and prepuce, and also a bubo in the groin: he said these complaints began to appear two months ago. He was ordered one grain of calomel twice daily, with 15 grains of the oxygenated muriate of potash four times a day; and the sores to be washed with the saturnine lotion.

July 4th, The chancres are healed; the bubo is subsiding; he has not any soreness of the mouth.

The

The calomel and the oxygenated muriate to be continued ; and electric sparks to be drawn from the bubo.

Sept. 8th, He was discharged cured.

CASE LXXVII.

Gunner Nugent was admitted into the Hospital *the 18th May*, 1798, with a venereal chancre upon the penis, and an incipient bubo in the left groin ; the fore, he said, began to appear about a week ago. He was ordered 15 grains of the oxygenated muriate of potash four times daily ; and the fore to be washed with the saturnine lotion.

May 30th, The fore does not heal. He was ordered one grain of calomel twice daily ; and the oxygenated muriate of potash to be continued.

June 21st, The bubo has broke ; the chancre has healed. The calomel and the oxygenated muriate to be continued.

Aug. 10th, The fore in the groin does not heal. The solution of nitrated mercury to be applied to the fore ; the calomel and the oxygenated muriate to be continued.

Oct. 2d, The fore is not yet healed. He was ordered half an ounce of Peruvian bark daily ; the calomel and the oxygenated muriate to be continued. The cure I fear will be tedious.

CASE LXXVIII.

Driver Hough was admitted into the Hospital, the 23d June, 1798, with several venereal chancres upon the glans penis: he said these began to appear four weeks ago. He was ordered one grain of calomel twice daily, with 15 grains of the oxygenated muriate of potash four times a day; and the sores to be washed with the saturnine lotion.

July 15th, The chancres are healed. The calomel and the oxygenated muriate to be continued.

July 30th, He was discharged cured.

Remarks.

Exclusive of these cases, I have now in the Hospital, under my charge, twenty patients, who are either taking the oxygenated muriate of potash, or the nitrous acid. These men have been so recently admitted, that the progress, though going on well, is not so distinctly marked, as to render a detail necessary. But two of them, being secondary cases of the disease, I shall be a little more particular with respect to them. One of the patients has been repeatedly treated with mercury; he has venereal nodes, sore throat, and severe headachs, and is now much relieved by the nitrous acid.

The

The other is that of a man, who, nearly two years ago, was repeatedly treated with mercury. The venereal symptoms gave way ; but as his general health had suffered a good deal, he was allowed to go into the country among his friends, where he remained near twelve months : when he had venereal eruptions upon his face, and several venereal ulcers upon his thighs and legs, with sore throat ; he said these complaints had continued three months. He was ordered 25 grains of the oxygenated muriate of potash four times daily ; from which he has already received benefit, though he has only taken it a few days.

Having been in a great measure convinced, that our former cases of the Lues Venerea, as communicated to the Public by DOCTOR ROLLO, in the first edition of his work on Diabetes, &c. were completely cured by the new remedies, I was induced to persevere in their general use : the result of which has been given in the preceding cases, and they are very faithfully related.

As the principal part of my patients were young men, and in high health, I frequently had recourse to evacuations, as blood-letting and cathartics, previous to the use of the remedies. I am inclined to think this method was frequently beneficial. It having been discovered that the oxygenated muriate of potash passed off by the urine not decomposed, it was suggested to give 10 drops of the muriatic acid,

acid, in a little water, after each dose of the salt. By this means, I almost invariably found the medicine to be decomposed; however, it was not every patient that required this assistance; for in the weak dyspeptic stomach, the salt was found to be completely decomposed. I more particularly witnessed this fact in a dropical patient, to whom I gave it by way of trial. He took 160 grains daily, and decomposed the whole of this quantity; but it produced very sensible effects in the system; he had a hot skin, headach, a quick, full, and hard pulse; white tongue; and the urine was considerably augmented during several days.

The topical applications employed were either a weak solution of acetite of lead, nitrated mercury, or, an ointment consisting of wax and oil.

The cases of *Gunner Lisheman*, *Drivers Hedge* and *Collins*, were very bad and tedious; nevertheless, by adhering steadily to the new remedies alone, complete and satisfactory cures were obtained. Indeed, at one period in the cure of these patients, I was about to lay them aside, and call in the aid of mercury. In these I occasionally derived benefit from the topical application of the carbonic acid and hydrogenous gases.

Secondary symptoms are acknowledged to have appeared in some of my patients, treated by the new remedies; yet these symptoms were at length
completely

completely removed by persevering with them. Similar circumstances frequently attend the mercurial treatment; and sometimes to obtain a cure, a varied preparation may be necessary. As *Driver Chrifley's* sore was not positively known to be venereal; the acid was not pushed as it ought to have been; and hence I attribute the appearance of his secondary symptoms.

Having seen in DOCTOR BEDDOE'S Reports, page 67, that DOCTOR RUTHERFORD, of Edinburgh, had employed the nitrous acid, joined with mercury, in some cases, with apparent benefit, I was desirous of trying the effects of that combination, and 12 patients were selected for this purpose; half the number were treated with calomel and the oxygenated muriate of potash; and the remainder by the nitrous acid and calcined mercury. From the trials I have yet made, I cannot say that I have seen much benefit from this combined plan. Indeed, I have thought that venereal sores, either from chancres or from buboes, have healed more readily, treated with the new remedies alone, than when mercury was employed. Though the cure of *Gunner Steward*, which was a bad case, was so speedy by the combined plan, as to give me at one time a very favourable expectation of this mode of treatment.

I have had much satisfaction in perceiving my venereal patients go from the Hospital in apparent
good

good health ; whereas formerly, even under the most careful exhibition of mercury, the constitution not unfrequently became injured, particularly in scrophulous habits, where glandular tumors, sores, and even phthifical symptoms frequently supervened.

SECT II.

A TABLE,

CONTAINING

A List of the Patients with the Venereal Disease, who have been treated in the ROYAL ARTILLERY HOSPITAL, at Woolwich, by the new Medicines; specifying the Nature of their Complaints, the particular Remedies employed, and by whom given, with the Periods of their Admission and Discharge.

N. B. Ir. stands for Irwin—Ja. for Jamefon—C. for Cruickshank—and W. for Wittman.

R r

Battalion.

Battalion	Men's Names.	Nature of the Disease.				By whom treated	Period of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruptions	Node	Admission.	Discharge.
1st	Sherrar	—	1	—	—	—	Mar. 10, 1797	April 26, 1797
	Evans	1	—	—	—	—	10, do.	16, do.
	More	1	—	—	—	—	10, do.	19, do.
	Clarke	1	—	—	—	—	10, do.	11, do.
	Beats	several	—	—	—	—	8, do.	26, do.
	Smith	do.	1	—	—	—	28, do.	14, do.
	Davenport	—	1	—	—	—	8, do.	14, do.
	Henderfon	deep	2	—	—	—	10, do.	8, 1798
	Hart	several	—	—	—	—	11, do.	25, 1797
	Muddling	1	—	—	—	—	Aug. 23, 1798	Sept. 24, 1798
	King	several	—	—	—	—	Mar. 8, 1797	June 30, 1797
	Smiley	do.	—	—	—	—	12, do.	3, do.
2d	Middleton	1	—	—	—	—	15, do.	18, do.
	Fanside	deep	—	—	—	—	29, do.	1, do.
	Johnstone	several	—	—	—	—	Aug. 22, do.	4, 1798
	Wardley	1	—	—	—	—	28, do.	19, 1797
	Fowler	1	—	—	—	—	29, do.	12, do.
	Porter	1	—	—	—	—	Sept. 10, do.	13, 1798
	Wardly	Excor's.	—	—	—	—	Dec. 1, do.	11, 1797
		—	—	—	—	—		
		—	—	—	—	—		
		—	—	—	—	—		

Battalion	Men's Names.	Nature of the Disease.					By whom treated	Period of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruptions	Nodes		Admission.	Discharge.
2d	Yoaly	phym's	—	—	—	—	W	Dec. 6, 1797	Dec. 12, 1797
	Ferner	feveral	—	—	—	—	W	Jan. 20, 1798	Jan. 20, 1798
	Porter	1	2	—	—	—	W	June 9, 1798	July 4, do.
	Condie	feveral	—	—	—	—	W	Sept. 10, do.	Sept. 8, do.
	Deacon	1	1	—	—	—	W	July 2, do.	July 23, do.
	Arnot	feveral	—	—	—	—	W	Oct. 7, do.	Oct. 22, do.
	Fennide	do.	2	—	—	—	W	Aug. 12, do.	Sept. 29, 1798
	Royals	do.	—	—	—	—	W	Oct. 17, do.	—
	Blackly	do.	—	—	—	—	W	Oct. 30, do.	Oct. 27, 1798
	Halliday	feveral	—	—	—	—	C	Mar. 12, 1797	April 18, 1797
3d	Clarke, jun.	1	—	—	—	—	C	12, do.	3, do.
	Batterby	1	—	—	—	—	C	13, do.	3, do.
	Ritton	1	1	—	—	—	W	26, do.	July 24, do.
	Taylor	1	1	—	—	—	W	20, do.	May 26, do.
	Patterfon	feveral	—	—	—	—	W	April 15, do.	June 3, do.
	Werburton	do.	—	—	—	—	W	18, do.	May 15, do.
	Perry	1	—	—	—	—	W	19, do.	15, do.
	Clark, sen.	2	1	—	—	—	Ir	June 30, do.	Sept. 5, do.
	Potter	1	1	—	—	—	Ir	Aug. 17, do.	12, do.

Battalion	Men's Names.	Nature of the Disease.					By whom treated	Periods of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruption	Node		Admission.	Discharge
3d	Barker	I	I	—	—	—	Ir	Aug. 26, 1797	Nov. 10, 1797
	Young	—	I	—	—	—	Ir	Sept. 3, do.	Oct. 7, do.
	Green	several	I	—	—	—	Ir	3, do.	27, do.
	Pilkington	do.	—	—	—	—	Ir	13, do.	8, do.
	Taylor	—	I	—	—	—	Ir	15, do.	18, do.
	Morrison	—	I	—	—	—	Ir	20, do.	4, do.
	Newenham	several	I	—	—	—	Ir	Oct. 15, do.	Jan. 4, 1798
	M'Queen	do.	I	—	—	—	Ir	16, do.	Feb. 19, do.
	Crowthaw	I	I	—	—	—	Ir	29, do.	Jan. 3, do.
	Lipthorp	I	I	—	—	—	Ir	Nov. 16, do.	Dec. 15, do.
	Durant	I	—	—	—	—	Ir	Dec. 26, do.	Mar. 16, do.
	Harrison	several	—	—	—	—	Ir	July 1, 1798	Aug. 4, do.
	Shaw	do.	—	—	—	—	Ir	29, do.	17, do.
	Marshall	I	I	—	—	—	Ir	Aug. 7, do.	Nov. 3, do.
	Matterhead	I	—	—	—	—	Ir	Sept. 2, do.	
	Durant	—	I	—	—	—	Ir	4, do.	
4th	Kane	several	—	—	—	—	Ja	Mar. 10, 1797	May 26, 1797
	Gray	I	—	—	—	—	C	12, do.	11, do.
	M'Callin	several	—	—	—	—	W	July 3, do.	July 25, do.

Battalion	Men's Names.	Nature of the Disease.				By whom treated	Periods of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruption	Node	Admission.	Discharge.
4th	Atkinson	—	—	—	—	—	Aug. 1, 1797	Sept. 28, 1797
	Buchannan	—	—	—	—	—	Sept. 16, do.	Oct. 30, do.
	Hammil	—	—	—	—	—	Sept. 27, do.	Dec. 26, do.
	Varley	several	—	—	—	—	Oct. 1, do.	Jan. 29, 1798
	Thompson	do.	—	—	—	—	Oct. 31, do.	do.
	Stewart	do.	—	—	—	—	Nov. 6, do.	do.
	McCurry	do.	—	—	—	—	Dec. 14, do.	do.
	Petrie	—	—	—	—	—	Jan. 1, 1798	Dec. 25, 1797
	Stewart	—	—	—	—	—	Jan. 16, do.	May 4, 1798
	Hammil	—	—	—	—	—	Feb. 20, do.	Mar. 3, do.
	Higgingbottom	—	—	—	—	—	Feb. 2, do.	Feb. 16, do.
	Darling	—	—	—	—	—	Feb. 3, do.	April 16, do.
	Dougherty	—	—	—	—	—	Mar. 10, do.	do.
	Johnstone	—	—	—	—	—	Mar. 11, do.	Mar. 19, do.
	Johnstone	—	—	—	—	—	Mar. 12, do.	June 9, do.
	Clofey	several	—	—	—	—	June 16, do.	do.
	Millis	—	—	—	—	—	June 10, do.	April 9, do.
	Holt	several	—	—	—	—	July 13, do.	Aug. 8, do.
	Graham	—	—	—	—	—	Aug. 15, do.	Sept. 26, 1798
	Smith	several	—	—	—	—	Aug. 7, do.	Oct. 8, do.

Battalion	Men's Names.	Nature of the Disease.				Particular Remedies employed.	By whom treated	Periods of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruption	Node		Admission.	Discharge.
4th	Cockshaw	—	1	—	—	—	W	Aug. 17, 1798	Sept. 8, 1798
	Wilfon	1	—	—	—	—	W	1, do.	Aug. 18, do.
5th	Kemp	several	—	—	—	—	W	Mar. 13, 1797	April 9, 1797
	Piggot	do.	—	—	—	—	W	16, do.	3, do.
	Pilmore	1	—	—	—	—	W	April 9, do.	9, do.
	Babb	1	—	—	—	—	C	May 25, do.	8, do.
	Kelk	—	—	—	1	1	W	July 19, do.	Sept. 28, do.
	Boisworth	—	—	—	—	—	W	22, do.	18, do.
	Waldron	several	—	—	—	—	W	Nov. 9, do.	Dec. 16, do.
	Mackie	—	1	—	—	—	W	Dec. 27, do.	Feb. 23, 1798
	Lishman	several	—	—	—	—	W	Jan. 27, 1798	April 9, do.
	Thomas	do.	2	—	—	—	W	Feb. 5, do.	Feb. 26, do.
	Thornton	1	1	—	—	—	W	21, do.	April 9, do.
	Welder	several	—	—	—	—	W	March 18, do.	May 24, do.
	Pidd	do.	—	—	—	—	W	19, do.	1, do.
	Itch	1	—	—	1	—	W	29, do.	July 6, do.
	Nugent	1	1	—	—	—	W	May 28, do.	Aug. 24, 1798
	Simpson	1	1	—	—	—	W	June 4, do.	Oct. 6, do.
	Parkinson	several	—	—	—	—	W	17, do.	

Battalion	Men's Names.	Nature of the Disease.				Particular Remedies employed.	By whom treated	Periods of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruption	Node		Admission.	Discharge.
5th	Allerdice	several	—	—	—	—	W	July 13, 1798	Sept. 1, 1798
	Lifman	—	—	—	—	—	W	May 18, do.	July 4, do.
Horse Brigade.	McVee	—	—	—	—	—	Ir	March 23, 1797	Mar. 31, 1797
	Barnley	—	—	—	—	—	Ir	March 26, do.	April 19, do.
	Brown	—	—	—	—	—	Ir	April 1, do.	May 18, do.
	Connor	—	—	—	—	—	Ir	April 6, do.	Dec. 19, do.
	Berryman	several	—	—	—	—	C	May 27, do.	June 7, do.
	Patner	do.	—	—	—	—	C	May 28, do.	June 6, do.
	Blades	2	—	—	—	—	Ir	June 24, do.	Aug. 18, do.
	Mackie	—	—	—	—	—	Ir	Jan. 6, 1798	Feb. 26, 1798
	Hampson	—	—	—	—	—	Ir	July 30, do.	Aug. 29, do.
	Campbell	several	—	—	—	—	C	Mar. 12, 1797	April 28, 1797
C.C.C.	Sneed	—	—	—	—	—	C	Mar. 18, do.	April 22, do.
	Cowen	several	—	—	—	—	C	May 18, do.	May 5, do.
	Kilpatrick	do.	—	—	—	—	C	May 18, do.	May 12, do.
	Johnstone	—	—	—	—	—	C	May 18, do.	May 11, do.
	Croucher	—	—	—	—	—	C	June 11, do	June 30, do.

Battalion	Men's Names.	Nature of the Disease.				By whom treated	Periods of Admission and Discharge.	
		Chancre	Bubo	S. Throat	Eruption		Admission.	Discharge.
C.C.C.	Dhillana	1	2	—	—	W	Feb. 10, 1798	March 28, 1798
	Christly	—	1	—	—	W	12, do.	28, do.
	Irwin	1	1	—	—	W	March 19, do.	June 16, do.
	Grant	1	1	—	—	W	19, do.	April 12, do.
	Duncan, sen.	1	1	—	—	W	May 20, do.	July 14, do.
	Christly	1	1	—	1	W	20, do.	June 26, do.
	Segar	1	—	—	—	W	22, do.	25, do.
	Twigg	several	—	—	—	W	23, do.	July 11, do.
	Taylor	do.	—	—	—	W	June 16, do.	Aug. 15, do.
	Serjeant	do.	1	—	—	W	18, do.	Sept. 7, do.
	Grant	do.	1	—	—	W	19, do.	27, do.
	Hough	do.	1	—	—	W	22, do.	July 30, do.
	Waldron	do.	1	—	—	W	8, do.	Sept. 7, do.
	Littlejohn	do.	2	—	—	W	8, do.	Sept. 15, 1798
	Stanfield	1	—	—	—	W	2, do.	12, do.
	Whitehead	—	—	1	1	W	4, do.	Nov. 1, do.
	Drummond	deep	—	—	—	W	9, do.	Oct. 11, 1798
	Whitworth	several	—	—	—	W	18, do.	12, do.
	Baker	1	1	—	—	W	July 15, do.	July 20, do.
	Benfield	—	—	—	1	W	May 13, do.	
	Jane Robb	several	1	—	—	W		

NOTE, Exclusive of the Patients in this Table, there have been recently admitted into the Hospital thirty-four Cases, which are now under Cure by the same Remedies, and going on well the 1st November, 1798.

GENERAL ABSTRACT

Of the Patients as enumerated in the Table, dividing their Cases into the Primary and Secondary Nature of the Venereal Disease, specifying the particular Remedies employed and the respective Numbers who have been treated.

1st. PRIMARY DISEASE.	Number of Patients.
<i>Remedies employed.</i>	
Nitrous acid	54
Oxygenated muriate of potash	54
————— manganese	3
————— muriatic acid	4
Lemon juice	3
Nitrous acid and oxygenated muriate of potash	7
Ditto and oxygenated muriate of manganese	1
Mercury and the new remedies combined	16
Total	142
2d. SECONDARY DISEASE.	
Nitrous acid	5
Oxygenated muriate of potash	5
————— manganese and potash	1
Nitrous acid and oxygenated muriate of potash	2
Total	13

SECT.

SECT III.

Some additional Remarks on the Effects of Nitrous Acid, the Oxygenated Muriate of Potash, &c. in Lues Venerea, by MR. CRUICKSHANK.

EIGHTEEN months have now elapsed, since the first cases treated by these remedies have been cured; and of the first seventeen, which were more immediately under our own management, not one has relapsed, nor have the secondary symptoms made their appearance in a single instance. That the disease has been completely eradicated can therefore admit of no doubt.

In our first trials we confined ourselves, in a great measure, to primary affections; but for some time past no distinction has been made, and the secondary as well as primary symptoms have been all treated by the same plan.

The total number which have now been cured, in the Hospital, since the beginning of March, 1797, amounts to 155, as will appear from the table; of these 13 had the secondary symptoms of the disease. This small number of secondary cases proves, in a great measure, the certainty and efficacy of this mode of treatment; for as DOCTOR WITTMAN employed these remedies in all venereal affections,

affections, whatever their nature might be, had the cures not been perfect, the secondary disease must have been very common; besides, of the thirteen, three only could be ascribed to this cause, and these were all afterwards cured by the oxygenated muriate of potash. Of the remaining ten, four appeared to be the natural consequence and progress of the disease, and six followed a course of mercury.

The cases of *Lishman* and *Christly* are, in our opinion, particularly valuable, as neither of them, it would seem, had continued the medicines for a sufficient length of time, and in both, the secondary symptoms made their appearance, but were afterwards completely removed by persevering in the same mode of treatment. Could mercury have done more? We would recommend these cases, with those of *Kelk*, *Johnson*, *Donally*, and *Bosworth*, to the serious consideration of all the advocates for mercury, and would ask them, at the same time, how many cases of secondary disease might 155 of the above description, treated in the usual way, have afforded?*

* See MR. BLAIR'S treatise on this subject, where it appears, that of 37 secondary cases related by him, 17 certainly followed a mercurial course, and probably there were more. The cases of *H. Brown*, *Death*, *Turner*, *J. Brown*, and *Puddicomb*, are particularly valuable, as they prove that relapses may take place after a course of mercury, however judiciously conducted.—*H. Brown* relapsed three times, and was no less than three times salivated.

Upon the whole, we are confident, that fewer troublesome buboes have been met with, than usually occur under the mercurial treatment, and none of them have spread and ulcerated in the dreadful manner, which too often happens under that remedy.

In a few instances glandular swellings have made their appearance, but these have been rare, and probably were not altogether owing to the medicines.

There are some facts respecting these remedies, more particularly the oxygenated muriate of potash, which deserve to be noticed and attended to.

In the first place, it sometimes happens, that in certain constitutions, the oxygenated muriate passes off by urine undecomposed, and produces but little or no effect, either on the disease, or constitution, much in the same way as mercury runs off by the bowels. In these cases the patients generally complain of heat of urine, which they void frequently, and in large quantities; whenever, therefore, such symptoms occur, the urine should be examined by evaporating, and then separating the saline from the extractive matter by spirits of wine and repeated crystallization. This being done, the oxygenated salt may readily be detected, by the figure of the crystals, and by its detonating when thrown upon red hot coals. In order to remedy this defect, we have proposed, that each dose of the salt
should

should be immediately followed by 10 or 15 drops of some acid, diluted with water; and for this purpose the muriatic has been preferred, although the nitrous might answer equally well, as either of them decomposes the oxygenated muriate with great facility. This inconvenience is generally met with in scrophulous constitutions, where the extractive matter in the urine is naturally but small, or where the medicine has been given in very large doses, as 30 grains or more four times a day, a quantity, however, which we believe to be very seldom necessary. It may be remarked that, in our first cases, we commenced with very small doses, as four or five grains, but are now satisfied that 10 or 15 may be given four times a day at the very beginning. This quantity should be gradually increased to 25, or at most to 30 grains, according to circumstances; and whenever we suspect, from the want of action on the system or disease, that it is not decomposed, it ought immediately to be joined with an acid, which seldom or never fails of having the desired effect*.

Another circumstance meriting attention, and which not unfrequently follows the use of these remedies, more particularly the oxygenated muriate of potash, is an eruption on the skin of a

* This medicine, in our opinion, should always be given in solution. The method of giving it in a solid form is certainly objectionable.

dull red colour, not very unlike venereal blotches. They may, however, be distinguished from these by the floridness of the colour, the itching with which they are accompanied, and their disappearing without throwing off scales, or leaving any livid or copper coloured marks. These spots never made their appearance but when the patients were under the full action of the medicine, and generally went off in two or three weeks, under a continuance of the same treatment.

In one instance, where mercury had been given from the beginning, and very freely, along with the oxygenated muriate; the body was at one time covered with them, and they disappeared about the usual period. This in a great measure proves that they are not venereal.

A third observation which we would make respecting these remedies is, that they have always acted with the greatest certainty, and quickness, where the system has been reduced. This would seem to point out the propriety of evacuations, more especially by blood-letting, in all full and robust habits, previous to their exhibition. In confirmation of this, we may observe, that in every instance where these have been employed, the practice has been attended with manifest advantage.

Since our first publication, in July, 1797, we have only tried one new preparation, viz, the black solution of manganese in the muriatic acid. This
was

was given in four cases with success, but being disagreeable, and not apparently possessing any superior advantages, it has not been persevered in.

Of the different remedies employed, we formerly gave the preference to the oxygenated muriate of potash, and we are now more convinced of its superiority ; for there have been many cases where it has succeeded much better than the nitrous acid.

We were naturally led to suppose, that a combination of these remedies with mercury would be more efficacious and certain than either alone ; or, at least, that much less mercury might be necessary. Accordingly, about 13 cases were treated in this way, but the result did not altogether answer our expectations ; for although a few of the cures were accomplished in a very short time, the greater part proved rather tedious. There have been, indeed, a few instances, where, after the constitution had for some time been fully under the action of the new remedies, mercury has been given ; and in these it appeared to have completed a cure very quickly. It is possible that this may be the most advantageous mode of combination.

We do not presume to account for the numerous failures which have been recorded, but suspect that they are to be ascribed either to some irregularity, or impropriety in the administration of the remedies, or to a want of perseverance and steadiness in the practitioner or patient. It is also
proper

proper to remark, that in these failures the remedies were too seldom varied, so that when one did not answer immediately, it was dropped, and mercury had recourse to. Now we are confident that much of our uniform success has been owing to the method which was very early adopted, of changing the preparation whenever it seemed to produce no further effect on the disease or constitution. In this way a number of cures were quickly obtained by the oxygenated muriate of potash, where the nitrous acid, &c. had not so immediately succeeded.

We shall conclude these remarks with observing, that one of the two following positions must be admitted—Either these remedies cure the Lues Venerea, or, in 99 cases out of 100, the disease cures itself. Our opponents may take which side they choose; for on either supposition, mercury must be unnecessary, and this is our principal object.

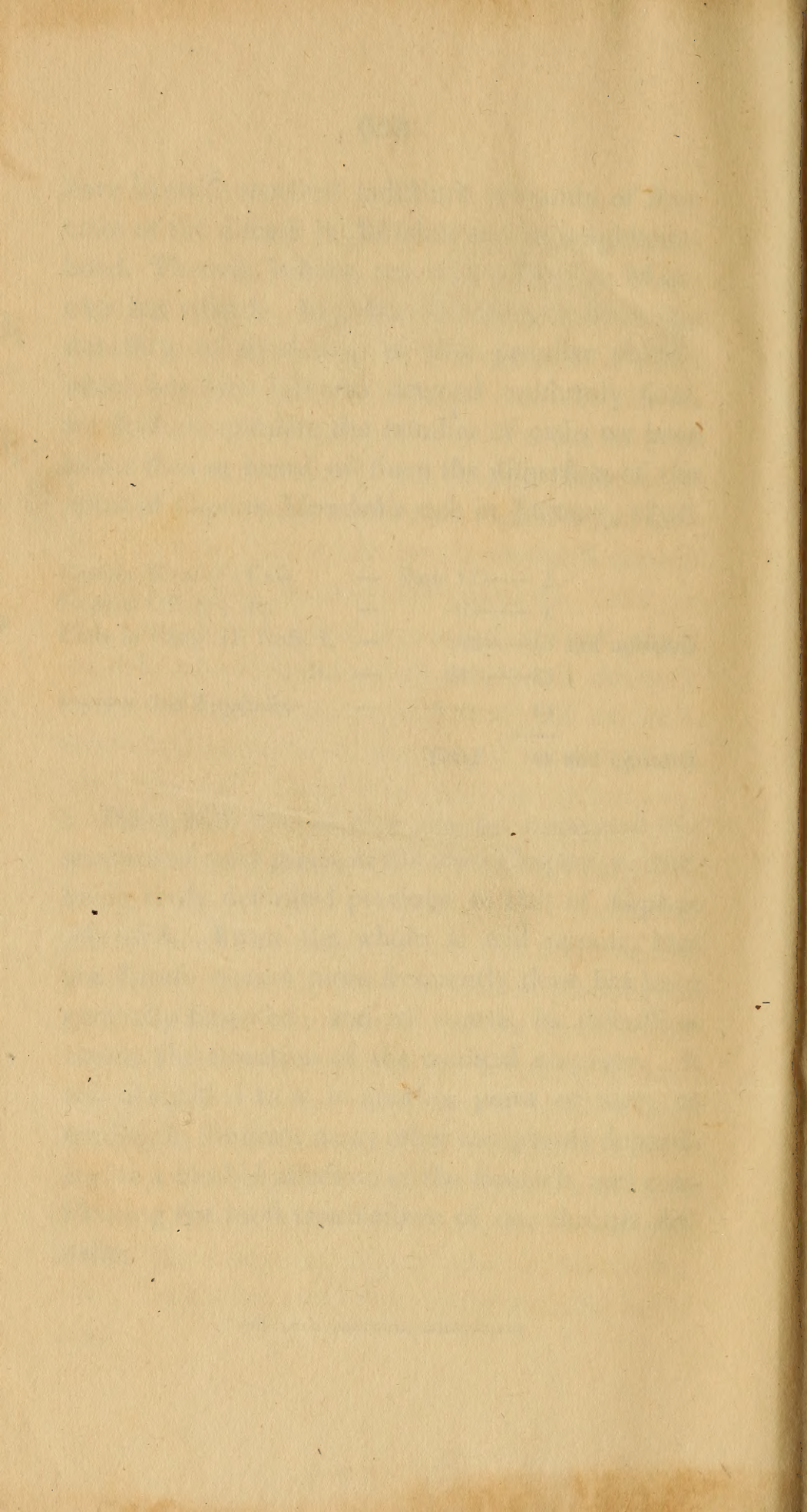
APPENDIX.

EXCLUSIVE of the cases of the Diabetes Mellitus, which have been published in this Work, we have heard of several others, particularly of one in Guy's Hospital, but we remain unacquainted with all the circumstances. DOCTOR ODIER, of Geneva, mentions a case in the Bibliothèque Britannique, vol. vii. p. 321, and vol. viii. p. 168. DOCTOR WILMOT, at Hawkehurst, in Kent, has also had a case under his charge; and DOCTOR YEATS, at Bedford, informs us of a patient he has successfully treated by the animal food; but as he intends to communicate an account of it, we defer any detail. DOCTOR BEDDOES has very lately mentioned to us four cases of the disease, one of which has been cured by the diet alone. He observes, "that in one case, he endeavoured to please the palate by recommending occasionally articles of food, as nearly resembling dishes made of the farinacea as possible. Tripe fried in a certain way resembles pancake. Buttered eggs offered an agreeable variety. He also advised a method of trying to reduce dried fish and flesh into a kind of flour. These culinary considerations are extremely important; and he has no doubt a diet might be contrived under which patients would feel little privation." We have

have likewise received indistinct accounts of four cases of the disease in London and its neighbourhood. There is, besides, one which DOCTOR MARCET has visited. In order, therefore, to shew the necessity of attending to this peculiar disease, which has been hitherto deemed uniformly fatal, we shall recapitulate the number of cases we have either seen or heard of since the dispersion of the notes of *Captain Meredith's* case in January, 1797.

<i>Captain Meredith's</i> Case	—	Page 17	—	1
General Officer's do.	—	63	—	1
Cases in Chap. II. Sect. I.	—	142	—	10 and upwards
	II.	—	237	— 23
— this Appendix	—	—	—	13
Total				48 and upwards

Along with this number may be examined the account of cases given in the third Chapter, p. 356, being those described previous to that of *Captain Meredith*. From the whole it will appear, that the disease occurs more frequently than has been generally supposed; and of course, its discussion claims the attention of the medical enquirer. It also is entitled to it in another point of view, as tending to illustrate many other complaints depending on a morbid affection of the stomach, and constituting the most troublesome of our chronic diseases.



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